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Cleaning Room Merits Study

Various Classes of Foundry Work Call for Different Kinds of Cleaning Equipment—Handling of Pieces to Be Cleaned Important Consideration

BY L. D. PEIK*

FOUNDRY cleaning room equipment has made real progress from the makeshifts that were common 15 years ago. Founders have learned that there is real economy in improving their cleaning methods and in eliminating dust, but some of them still hesitate to invest in cleaning equipment because of the uncertainty of their production, which fluctuates considerably with the seasons and market conditions. Moreover because of divergencies in production methods, in the routing of work and in costs, the same job or the same class of work cannot be handled in precisely the same way in different foundries.

Despite the large variety of cleaning equipment and dust collecting systems now on the market, the specific needs of a given foundry frequently call for installations that differ, at least slightly, from anything built before.

While standard equipment should be adapted to the purchaser's requirements so far as possible, the founder buying equipment should first study his problem in cooperation with an engineer. Such a joint survey will tend to prevent subsequent complications and will make additional investments in equipment economical. On the other hand, the improper use of a piece of equipment means a rapid decline in its serviceability, with a resultant loss of confidence between buyer and seller.

Classes of Work That May Be Cleaned by Sand Blast

In the metal industry there are several classes of work that can be satisfactorily cleaned by sand blast. In each of the groups in the table are listed a number of commonly known commercial pieces, including forgings and rolled products as well as castings.

It will be noted that the products listed call for widely different finishes, as well as methods of handling. Pieces in Group 1 can usually be conveyed by traveling crane to an industrial car which runs on rails into a sand blast room. The overhead crane is also employed to turn the pieces over.

In Group 2, parts, such as boiler sections, can be conveyed through a sand blast room by monorail trolley. Sanitary ware, including bathtubs and lavatories, can be handled economically on a turntable entirely inside a sand blast room or on a turntable that projects half way out of the room, as shown in the illustration.

In Group 3, cylinder blocks, radiators, crankcases and journal boxes are often put through a tumbling barrel, but in a number of foundries a sand blast room served by roller conveyors has been used to advantage. Parts having irregular surfaces like rear axle housings may be economically handled on a turntable. Pieces listed in Group 4 are best cleaned in a sand blast barrel.

Parts in Group 5 may be too frail in some instances to withstand the tumbling action of a sand blast barrel. These pieces can be best cleaned on a rotating table fully housed and equipped with sand blast guns, which is commonly known as an automatic rotary table. Certain classes of building hardware, forgings and gears, however, can be easily cleaned in a sand blast barrel.

Rolled steel pieces included in Group 6 require special cleaning equipment. A variety of sand blast machines for cleaning bar stock, pipe, flat stock and structural shapes is on the market. Some progress has been made also in developing methods of cleaning sheet metal and bands. This equipment, in many cases, is necessarily of a custom built character.

Group 7 embraces a wide range of parts. The selection of cleaning equipment depends to a large extent

Groups of Commercial Pieces Requiring Cleaning

1. Heavy frame-type castings weighing 500 lb. and over	Locomotive frames Car castings Steam shovel castings Industrial crane frames Engine beds Pump castings Gear rims
2. Medium-weight bulky pieces	Boiler sections Sanitary ware Table tops Transformer sections Piano frame plates Heaters
3. Medium-weight polygonal shapes	Cylinder blocks Crankcases Rear axle housings Radiators Switch boxes Journal boxes
4. Round and semi-round work	Pistons Car couplers Car knuckles Gears Carbureters Hub castings Differential housings Bearings Drop forgings
5. Small, light flat castings and pressed steel work	Resistance grids Meter boxes Building hardware Forgings Gears Stove plates
6. Flat sheets and structural steel	Alloy sheet steel Bar stock for bands and tire rims Structural shapes (rusted) Bar stock and pipe (rusted)
7. Light miscellaneous pieces	Line materials Electrical equipment Hardware and tools Gas burners and stove legs Farm implements Drop forgings Pulleys Plumbing goods

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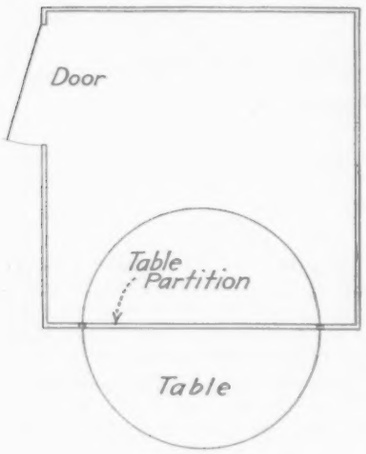
on the production and finish required. Ordinarily good results are obtained by cleaning these parts in a sand blast barrel.

Efficiency in Loading and Unloading Sand Blast Equipment Important

Among the most important factors in the cleaning problem are the handling and transportation of the material, particularly the loading and unloading of sand blast equipment.

A lack of loading facilities, as well as slowness in cleaning, has resulted in some instances in a replacement of the ordinary tumbling barrel by the sand blast. There has been considerable improvement, however, in tumbling barrel practice. In a number of foundries the barrels have been suspended through an opening in an upper floor so that castings can be discharged into them from a dump truck or wheelbar-



THE Sand Blast Room Operator Has Access to Five Sides of the Work and Can Play the Stream of His Gun from Almost Any Angle. When a room is equipped with a table, the operator cleans pieces on the half of the table inside while the half outside is being loaded

row. After tumbling, the contents of the barrels are unloaded into a chute which deposits the castings on a series of grate bars for sorting and inspection. The stars are returned to the barrels by means of an elevator, the boot of which is located beneath the grate bars.

The tumbling action, however, has a tendency to round off all sharp edges on the outside of a casting and sometimes fails to clean recesses or deep cores thoroughly. Tumbling, therefore, is not adapted to cleaning some kinds of castings. In foundries making radiator sections, for example, the specifications call for certain streamline beads and other ornamentations which, of course, must be preserved. Tumbling partly destroys these and fills the cores with stars, the removal of which means additional labor.

Sand blasting, on the other hand, preserves the outer edges of the castings but is said to cost more than tumbling. The extra expense is due to the fact that the sand blast operation does not remove the cores in the radiator sections, necessitating an additional operation. It is believed, nevertheless, that a continuous production arrangement could be made to reduce the cost of sand blasting radiation.

Sand Blast Room and Humane Cabinet Compared

Among the various forms of sand blasting equipment, the sand blast room is adaptable to a large range of work and confines operations within a ventilated inclosure, retaining the good abrasive for reuse. The sand blast room lends itself to the use of various forms of material-handling equipment, including monorail trolleys, industrial trucks, turntables and grated or apron conveyors.

The humane cabinet equipped with a turntable projecting half way out of it is well suited for work not difficult to clean and with no inaccessible cores. In using this equipment an operator cleans the castings while a helper loads the table. Periodically the table is rotated to discharge cleaned work and to supply the operator with the next charge.

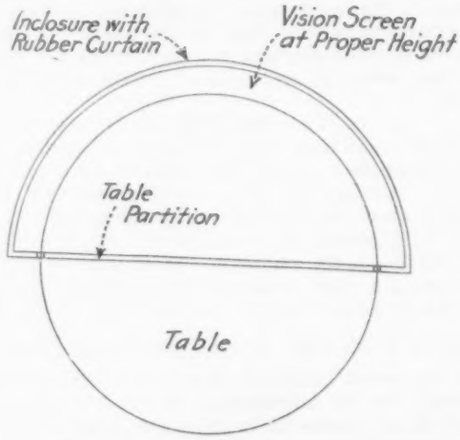
The sand blast room has an advantage over the humane cabinet in that the operator in the room has access to at least five sides of the work and is able to play the stream from his gun from almost any angle to obtain maximum production. The objectionable feature of the sand blast room is that the operator must wear a helmet as a protection from the abrasive and dust. On the other hand, the operator of a humane cabinet stands outside, but he is handicapped to some extent by restricted vision and slight interference from the curtain through which the blast is projected. On flat work, such as sanitary fittings, these difficulties do not seriously affect operations.

Automatic Rotary Table Effective in Handling Frail and Flat Pieces

The automatic rotary table is very effective in handling work that is frail and flat, as well as pressed metal articles. In this type of machine the table, after being loaded, passes under a battery of guns in an inclosure and discharges the finished work in one rotation. The operator loads and unloads at the same time in some cases, and in other instances, where two operators can be used conveniently, the loading is done by one man and the unloading by the other. Some classes of work must be turned over and passed through the inclosure a second time. All operations are automatic except loading and unloading. As the table rotates there is a steady flow from the guns. These are fed from a hopper above, which is continuously filled with abrasive. This machine, of course, has many mechanical parts, and its maintenance is somewhat more expensive than that of any other type of sand blast equipment with the possible exception of the sand blast barrel.

Sand Blast Barrel Well Adapted for Round or Semi-Round Work

The sand blast barrel, if properly equipped with loading devices and efficient guns, is particularly well adapted for round or semi-round work or for medium-sized polygonal pieces. Connecting rods, piston rings, pistons, wrist pins, stove legs and tops and plumbing fixtures are particularly well suited for the sand blast barrel. Gas and steam engine parts weighing less than



The Operator of a Humane Cabinet Stands Outside and Need Not Wear a Helmet as a Protection from Abrasive and Dust. He is handicapped to some extent by restricted vision and interference from the curtain through which the blast is projected

60 lb. each, and some classes of steel forgings, steel and gray iron castings, can be economically cleaned in this machine. Special attention should be given to the routing of work to and from the barrels and to the loading and unloading devices so that operations may be rendered as continuous as possible. Sand blast barrels can be operated by the ordinary class of help found in the foundry, and operations can be made as ideal from the standpoint of working conditions as running a machine in a machine shop.

Compressed Air Should Be Dry and Air Lines Should Be of Ample Size

Next in importance to the selection of the type of sand blast equipment is the compressed air supply. Air must be delivered to the sand blast guns as dry as pos-

sible, and the air lines must be of ample size to prevent undue friction losses. It is often found that air is less efficient under high than under low pressure because of friction losses in the pipes at or near the guns. Compressed air is much cheaper than labor on the basis of actual work performed. If more air will shorten the time of cleaning by 10 min., a reduction is effected not only in labor time but in air flow time as well.

Another important consideration in the cleaning room is the collection of dust. This should be done efficiently, especially in a tumbling mill or a sand blast barrel. The removal of all fine sand and dust during operations eliminates a cushion effect in the abrasion of the work. Dust removal from a sand blast room or a humane cabinet is necessary for clearing the atmosphere to permit vision. Dust should be removed from abrasive before its reuse because dusty abrasive is less efficient than clean, sharp sand.

The velocities in the dust pipes must be sufficient to carry away all of the very fine sand but not small bits of iron, as they would destroy the screens in the collector.

A cleaning room should be well maintained and well lighted, and should have good floors. A concrete floor around a sand blast unit is a good investment.

Extra parts should be kept in stock for sand blast equipment subject to abrasion and wear. Such parts include gun nozzles, hose and fittings, sand valves and liners.

Transverse Fissure Still a Mystery

Cannot Be Traced to Composition of Rail, Says Report—Fissure Detector Proves Effective

THERE is no inherent reason for attaching responsibility for the display of transverse fissures in rails to manufacturing conditions, either in the making or rolling of the steel, according to conclusions reached by the bureau of safety, Interstate Commerce Commission, on the basis of investigations it has conducted.

In the bureau's report of an accident that occurred on the St. Louis-San Francisco Railway near Victoria, Miss., on Oct. 27, 1925, which was the most serious accident due to a transverse fissure since this type of fracture was first brought to general notice 16 years ago, the outlook for overcoming the formation of transverse fissures is described as not promising. Intense study has not yet detected any specific cause for their prevalence in one heat of rails and their absence in another of similar composition, nor why from a metallurgical point of view one rail should display a transverse fissure after a very brief interval of time in the track and another endure for a long period.

It is logical to assume, says the report, that phenomena of this kind depend upon something else than a consideration of the initial physical properties of the rails themselves. The factors to be given consideration are the strains and stresses to which the rails are exposed. If proof attaches the causes of fracture to conditions of service, no other consideration is necessary to explain the reason for the prevalence of fractured rails.

It seems, however, that a means of detecting fissures in the track has been found, constituting the greatest accomplishment yet heralded, the report adds. Reference is made to an electrical resistance device of Elmer A. Sperry, which is said to be capable of locating fissures in different stages of development from those in area less than 2 per cent the area of the rail head, up to those that have separated the major part of its cross-section. The detector differentiates the interior fissures according to their sizes.

The report concludes with certain suggestions to the end that the serviceability of rails may be improved:

1. Steel rails would be improved against the display of certain common types of fracture by the elimination of both internal and external seaminess. Internal streaks or seaminess in the head and external seaminess at the lower surface of the base are two critical parts in the cross-section of a rail. Improvements at these two places would prolong the lives of certain rails.

Generically split heads and base fractures belong to the same type of rupture. Each results from the influence of a lateral force and each has its origin at a longitudinal seam or streak.

Impinging wheel pressures set up simultaneous strains in two directions in the top of the head. One component tends to form transverse fissures, the other to form split heads.

When lateral flow of the metal of the head encounters a slag or silicate streak, opportunity is presented for the formation of a split head.

In the metal of the base crosswise service stresses in the flanges lead to longitudinal fractures which originate at seams or laps.

After the same fashion that longitudinal cracks in the base are diverted and form crescent-shaped fragments, horizontal split heads are diverted from their courses and form compound transverse fissures. Vertical split-head fractures lead to the separation of the head from the web.

These two causes of rail fractures, internal and external seaminess, furnish problems for the steel mills to overcome or minimize.

Shrinkage cracks, in the heads and bases of rails, when and under what conditions they reach a maximum and rupture ensues, essentially constitute a research problem.

2. The railroads occupy a favorable position to acquire data upon the longevity of rails in respect to the display of transverse fissures. Material is at hand for comparing the properties of rails which have displayed transverse fissures at widely differing ages. The problem is to ascertain whether any physical, structural, or chemical factor is responsible for the variable behavior of rails in the track or whether differences in longevity are due to undefined track stresses.

3. Research problems specifically referring to steel rails, or in fact to steels in general, are somewhat numerous. Basically, steel can be used for rails, because it is capable of acquiring and retaining internal strains. They are necessarily both of tension and compression. Of what does this common property consist? Can the presence of a strain, positive or negative, be recognized in any other manner than by permitting its release?

Exhaustion of toughness may be reached with or without distortion of the grains. By what means can exhaustion of the ability to permanently elongate be recognized without subjecting the steel to its limit of ultimate resistance?

When changes in density occur, what are the interrelations of the microconstituents? These and kindred queries present themselves in studying the mutual relations, causes and effects, of wheels and rails. Information upon these basic features would be a contribution to the physics of steels in whatever situation this important metal is used.

In October, 1920, the Stearns-Stafford Roller Bearing Co., Lawton, Mich., equipped a Michigan Central Railroad freight car with roller bearings. The superintendent of rolling stock selected the arch bar type of trucks as affording the most severe test. The car has been operated continuously and with the exception of three inner raceways which, on an inspection made Feb. 21, 1923, showed hair line cracks due to the heavy pressure used at that time in getting them on the journals, there have been no replacements.

Orders for 1265 steel boilers aggregating 925,422 sq. ft. of heating surface are reported for October by the Department of Commerce. This compares with 1312 boilers of 1,152,265 sq. ft. in September and is considerably the lowest output for any month this year. For the ten months the total was 13,652, of 13,696,778 sq. ft.

Price-Cutting Which a Buyer Curbed

A Leaf from the Book of Trade Emphasizes the Consumer's Interest in a Stabilized Market — Selling Methods That Bring Demoralization

BY SAUNDERS NORVELL*

BY careful, honest, straight thinking and the elimination of details and side issues, almost every business situation can be boiled down to its essential facts. Then the problem, which at first appeared complicated, is usually found to be a simple one.

As we all know, on account of the fierce competition that now exists in this country, the reduction in profits and the continued high cost of doing business, many concerns are not especially enjoying this era of profitless prosperity. These conditions lead to situations, particularly between competitors, that call for very straight thinking. It may be interesting for me to tell some of the cases that have come under my observation. They are actual business situations that I know have existed and are existing.

One Cut Leads to Another

In a certain industry that sells raw material almost entirely to manufacturers, one large producer, by a secret cut in price, took a very valuable account away from one of his competitors. Of course, when this manufacturer stopped buying from his original source of supply, they realized what had happened. As this concern was not any too strong financially, in order to keep their business going they very naturally offered a cut price to another manufacturer, this cut price being less than the cost of production. They secured a large order. This order would at least keep them going for a year, even if they did not make any profit. With this producer it was not a question of making profits—it had become a question of existence; a question of not shutting down the factory and going into the hands of a receiver. A third producer in the same line of business, learning of these cuts, issued a circular in a spirit of retaliation in which he cut the price to the entire trade of the country—big and little.

Now we have the situation where this entire industry is on a price basis of less than the actual cost of producing the goods. In this situation, these several producers, in turn, with their cut prices each went after the business of a manufacturer who uses a large quantity of their goods. One would suppose that this manufacturer would have been delighted at the opportunity to buy his goods at a lower price. Here was an opportunity for him to obtain a raw material at a figure that would lead to a reduction in his manufacturing costs and, hence, if he maintained his own prices, to his making a larger and more satisfactory profit.

It Was the Buyer Who Saw the Light

However, imagine the surprise of these three producers when this manufacturer told them flat-footed that he did not wish a lower price. He told them, in fact, that, with conditions as they existed just at present, all of them were using exceedingly bad judgment to cut prices. This manufacturer said to them: "If you cut prices on your raw material, logically it will only be a question of time until this price-cutting will travel to the manufactured product. Just now, we are making only a small profit on the manufactured goods and we cannot stand a cut in price. As manufacturers, what we desire more than anything else is a stabilization of the market. If you cut your prices and if we cut our prices, this cutting of prices will automatically lead to a curtailment of business because everyone knows that the general trade never buy freely on a declining market.

"Now, gentlemen," said this manufacturer, who evidently had his nerve with him, "stop and think this thing over. Do not quote us any cut prices. Go home and withdraw the cut prices you have already made. Do your level best to fix up the situation. We ourselves will not be parties to any plan to demoralize our line of goods, and the first step is to stop the people from whom we buy our raw material from starting the demoralization."

How the Buyer Reasoned

Naturally, the position taken by this manufacturer, judged by common standards, was a rather original one In discussing the subject with him, I asked him to go a little deeper into his view of the situation. "Well," said this manufacturer to me, "we are one of the largest users of this product in this country. Naturally, we have always enjoyed an inside price on account of the quantity of the goods we buy. We have never used this inside price in our sales price. We have set it aside as an extra profit and it has helped us in developing our business and in giving better service to the trade.

"But don't you see, if all these producers in this line sell their goods at cost or at less than cost, they are not in a position to do anything, either for themselves or anybody else? When a market is demoralized and goods strike cost, the price is usually the same to everybody and even large and intelligent buyers can not obtain any special inside prices. Therefore it does not take much intelligence to see that it is not to the interests of a large buyer to see the market on any of the goods he uses go into a demoralized condition. Unfortunately," said my friend, "there are a number of buyers who buy for large institutions who have not thought deeply enough into the subject to see the truth of this principle."

Under present conditions, I think there are a good many jobbers and manufacturers who should think over the above conclusion of my far-sighted friend, who is one of the most successful manufacturers in the United States—a man who, in good times and bad, has always managed his business so as to come out with a profit. It is curious, however, to see a large buyer who under present conditions was not waiting to accept a cut price, but who on the contrary recommended to the sellers that they come to their senses and stabilize the market on their goods.

Receivership Competition Not Welcomed

Here is another interesting case that has recently come under my observation: In a certain industry, there is a very powerful seller who, by reason of almost unlimited capital and a great variety of products, has, by cutting the prices in one department of his field, practically eliminated all of his competitors. There are only three or four manufacturers left in this field

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in the United States. None of these manufacturers is making any money. This powerful manufacturer announced on a certain date that he proposed again to cut the price. One of his weaker competitors, who carries a large burden on his business in the form of bonds, went to this powerful rival and said: "Now, let us lay our cards on the table. Let us talk straight. You now sell a very large proportion of the goods in this line. You are selling these goods without any profit because you make profits on other goods that you manufacture in other lines. Just what is your object? Do you expect to kill off all of your competitors in this line and be the sole manufacturer of this line in the United States?"

"No," replied the powerful manufacturer. "Naturally, that situation would not appeal to me. Naturally I must have a certain amount of competition." "All right!" said this weaker manufacturer. "Which would you rather compete with—a concern like ours in our present condition *or a concern like ours in the hands of a receiver?* There is no question whatever that if this competition continues as it has been, we are going into the hands of a receiver. If we do go into the hands of a receiver, I will probably be the receiver myself. Naturally, as a receiver for the business, I will be relieved of the obligation of paying interest on bonds and I can also escape from many other obligations under which we now labor. In other words, don't you see that as a receiver I could be a much harder competitor for you than I am at present?"

Now, the curious point in this situation is that this powerful manufacturer never seemed to have thought of this. He was so busy with his other affairs that he had not thought exactly what would happen in the future if he continued selling this line on a destructive basis.

Selling Policies Call for Hard Thinking Higher Up

"But," said I to my friend who was telling me these interesting things about American business today and who also told me that these cases were not uncommon; that, no doubt, there were many of them in the trade in all of the various lines, "isn't it the object of these manufacturers today who are taking advantage of their strong financial position, to freeze out weaker competitors, to get the entire market in their hands and to be afterward in a position to advance prices?"

To this inquiry he made the most surprising answer. "No," said he. "I do not think that is true. What I do think is true in many industries is that the leading men—the men who have the capital invested—the real owners of the enterprise, when their businesses are in a prosperous condition have practically turned over the selling end to sales managers who are interested chiefly in making sales records. I am of the opinion that many of these sales managers in the United States today are doing things in the way of authorizing cut prices without thought of what it all means, and the heads of these businesses, in many cases, are not paying close attention to the business. They take the reports of the sales managers.

This merchant told me that in one industry he took occasion to call the attention of the head men in the business to some of the things their sales managers were doing. This led to an investigation of conditions upon the part of the heads of several large enterprises. These proprietors, who are older, who are mellower and who are not stirred up by the selling battle and all of the animosities and jealousies that arise in the selling of goods, got together quietly and talked over what their sales managers were doing.

The result of this meeting was that the sales managers received the surprise of their lives in some of the instructions that came to them direct from headquarters. Human nature is always human nature. All of us are very apt to be more generous on an expense account with someone else's money than we are when we are traveling and paying the bills out of our own pocket. All of us, being human, are more inclined to cut prices when the loss of profits as a result of the cut comes out of the pocket of some one else! "In other words," said my friend, "in my opinion, in the present selling situation in the United States, it is right up to the proprietors of the business to make a very thorough investigation of what their own selling organization is doing."

The Preferential Buyer May Be a Source of Demoralization

These reflections have all led me to think of buying and price-cutting. Some buyers with a 22-short mentality, when they secure a special concession, delight in telling all the salesmen who call upon them about the cut price. This puffs up their vanity. How foolish they are. I know of buyers who, when a salesman calls, will tell him that his prices are no good; that he had better write home and get lower figures so he will be in the game. What happens after a foolish talk of this kind? The salesman does write home. He does influence his house to give him lower prices. Then he calls on the competitor of our buyer and sells the competitor at these lower prices. In other words, by the loose wagging of his tongue our Smart Aleck buyer is simply helping his competitor buy his goods 5 to 10 per cent cheaper!

How well I remember that it was the policy of the Simmons Hardware Co. under I. W. Morton, that great buyer of the house, always to protect the seller on his prices. How well I remember when this house was enjoying a special rebate from a factory and other salesmen called, attempting to get the business, that they were told, *not that their prices were too high;* only that the house at that time just happened not to be needing any of the goods or had made other arrangements. In other words, it is one of the first duties of a good buyer to soothe the visiting salesman with the idea that his prices are entirely right and that other reasons besides prices led to the placing of the business elsewhere.

How many buyers have ever thought this out? How well I remember, in one case where Mr. Morton was enjoying an especially satisfactory arrangement with a certain manufacturer, that, instead of buying all of his goods from that manufacturer, he bought the same goods in smaller quantities from other manufacturers as well, the object of this buying being to cover up the fact that a special price was being received.

Give Thought to the Welfare of the Industry

Summing up the reflections in this article, it would seem that we should have a broader vision on the part of those in charge of sales and on the part of those in charge of buying than exists at present in many cases. All of us, in times like these, should think very seriously about the general welfare of the industry in which we are engaged. Paradoxical as it may appear, the manufacturer who comes around to the buyer with a cut price is not always the best friend of this buyer. This manufacturer is often an enemy to the welfare of the industry. All of us should get the principle in our minds that it is not always the low price that we receive which is the most advantageous. Low prices frequently lead to the demoralization of an entire industry. In every phase of this industry, from raw materials through the manufacturer, to the jobber, to the retail merchant, progress only can be made on those lines of goods where manufacturers, jobbers and retailers are making a fair and reasonable profit. Progress can never be made when goods are sold at cost or at less than cost.

The salesman who calls on you with a cut price is giving that cut price to your competitor. Often—in fact, usually—your competitor will use this cut price to reduce his prices. A cut price to you is generally followed by lowered profits. Let me repeat: It may be a paradoxical situation, but in many cases wise buyers, when a salesman offers them cut prices today, should ask: "Why the cut price? Are you giving it to everybody? What will be the net result of this cut price—not to us—but to our industry?" I think some of our selling friends will have difficulty in answering this question.

The Bourne-Fuller Co., Cleveland, has issued a pamphlet containing revised lists and packing schedules for bolts and nuts, effective April 1 and July 1, 1927.

Profits from Changed Methods

Business Put on Paying Basis by Thorough Study of All Factors, and Methodical Corrective Program—Policies Enlist Active Cooperation of Employees

BY JAMES W. HOOK

AN outstanding contribution to the third New England Conference, held in Springfield, Mass., Nov. 17 and 18, some of the proceedings of which are reported elsewhere in this issue, was an address on "Revitalizing a Business," by James W. Hook, president Geometric Tool Co., New Haven. The methods pursued in putting his company on a profit-earning basis, as outlined by Mr. Hook, are given in part in the following paragraphs:

I HAVE been persuaded to tell you the story of the revival of a small New England metal-working concern. The company is one of those fine old New England concerns which started on a shoe-string many years ago and grew to health and vigor long before the World War began. Then it rather ran off its races and, in the confusion of the times, laid the foundation for a period of serious depression following the war. Its troubles were many and varied, perhaps not unlike those experienced by thousands of other plants at that time. The principal difficulty was, in fact, that the company was not making money and, therefore, was not successful.

It might be interesting, before going into the story itself, to show how the new manager approached his problem and what were his basic thoughts on the subject of solving it.

He believed that the success of any business could be resolved into a simple formula in which earnings equal sales volume less all expenses. By the token, he believed and still believes that a success formula can be presupposed for any unsuccessful business. If a business is not successful, then the first thing to do to make it so is to predetermine a success formula for it, and set about at once to bring fundamental factors into line with the presupposed values. Profit, permissible in any business, always has a fixed minimum represented by the smallest amount of money required to pay dividends and replenish surplus. Profits equal sales volume less expenses: therefore, to increase profits, one must either increase sales or decrease expenses, or do both. By expenses is meant both labor and material cost, as well as all fixed expenses.

When the bare success formula is developed, it is then necessary to observe and record all important factors which will contribute to an increase in sales—such, for instance, as increase of prices, increase of consuming customers, increase of product sold, etc. It is also necessary to analyze expenses, list what the actual expenses are and start a determined drive to reduce them. One must always keep an eye on the final results to be attained.

Sometimes judicious reduction in selling prices will increase volume of sales sufficiently to increase profits substantially; sometimes an increase in one direction will bring about a larger reduction in another. An increase in selling expenses may reflect itself in a sales-volume increase sufficient to warrant the expense. The careful balancing of these figures, the judgment used in placing values on different items, and above all, the ability to make each item of expense produce something worth while, determines whether or not the presupposed success formula will be met.

Once a manager knows just what profit he must have, and what sales volume and expenses can be allotted to produce those profits, he will usually find some way to bring them into proper relationship. How often do we see the "would-be" manager paw around over a broad-topped desk, slicing some expenses here, increasing a selling price there, firing this one and that, and thinking he is putting his business on its feet. Disgruntled, distracted and insane boards of directors often do the same thing. Success in reviving a sick business is not accomplished that way. When a business is sick it must be treated as a sick thing, and its trouble diagnosed and scientifically and methodically treated.

Reduction in Stockable Sizes of Cutters Doubles Inventory Turnover

In the business I have been asked to tell about, the new manager found some ridiculous conditions prevailing. Not only did he find a sick business, but a sick industry as well. In the first place, he found a bad competitive situation. In the second place, he found every competitor attempting to carry almost every conceivable type of cutter in stock.

He found that his own company had made 55,000 different kinds of cutters in the past few years, 53,000 of which represented only 20 per cent of the sales volume. Of the 2000 cutters which represented 80 per cent of the sales volume, he found that about 400 sizes represented 90 per cent of the 80 per cent. In other words, of the 55,000 different sizes manufactured during a few years previous, 400 sizes represented 72 per cent of the sales volume. More amazing still, the unit selling price, size for size, was no different on the 54,600 sizes than on the 400.

When this amazing situation was submitted to all manufacturers in the industry, it was confirmed proportionately by all of them. From here it was not a long step to the Division of Simplified Practice of the Department of Commerce, which cooperated with the industry to the end that stockable sizes were reduced to even less than 400—about 200, in fact—and the remaining sizes placed on a special non-stockable extra-price basis that made them yield some profit.

The effect of this move upon the company in question was to reduce the total inventory, including finished goods, raw material and work in process, to less than one-half of what it had been, thus admitting of about four and one-half inventory turnovers a year instead of approximately two. The money released was used to retire more than one-half of the company's outstanding preferred stock, with a corresponding notable reduction of fixed expenses.

During the negotiations, the undesirable competitive practice of trading out competitive tools was done away with.

Perpetual Inventory System Improved

These two things alone were sufficient to put the business on a paying basis. Still more, however, was done. The company had maintained an elaborate perpetual inventory system. With 55,000 different kinds of items, to say nothing of the changing quantities of each, it had, indeed, to be elaborate. But it was not used for what a perpetual inventory should be used for. When asked the question, the head auditor replied that it was maintained so that the books of the company might be closed monthly, and a balance sheet prepared. He did not realize that the more important value of a perpetual inventory is to show currently what the sales are of each kind and size of product.

Today that perpetual inventory enables the company to manufacture inventory on a six weeks' basis. In other words, new orders for goods to replenish in-

ventory are based on a six-weeks' supply. This means that the total finished inventory is turned over practically every 11 weeks during the year. There is not much danger of getting obsolete stock in any inventory run on that basis. And when one eliminates obsolete stock, one eliminates a great item of expense. Because the simplified practice policy enormously reduced the number of items formerly carried in stock, the cost of maintaining the perpetual inventory was likewise greatly reduced.

Adoption of Closer Tolerances Had Comprehensive Effect

Another order which went into force almost at the outset of the company's revival was what became known around the plant as the "ten thousandth of an inch idea," as compared with the "thousandth of an inch idea" which had theretofore prevailed. To some this seemed a little contradictory, i.e., suggestive of smallness, or narrow-mindedness, when the opposite was meant. But the shop did not look at it that way. To the shop it meant harder work and better product.

Starting a plant to operate on a ten-thousandth of an inch basis, when for years it has been operating on more liberal tolerances, in itself introduces many problems. In this plant it meant better machines, better jigs, dies, tools, fixtures, more and better inspection tools and methods, better and more skilful workmen. Most important and difficult of all, it meant a different plant psychology.

When the plant saw that it must not only make its product better, but that it must also make it quicker, to compensate for reduction in inventory, and give satisfactory service to customers, some of the old-timers threw up their hands in despair. But when the word went around that no department would be denied equipment which, in the judgment of the engineering department, was necessary to meet the new and more stringent requirements, the situation eased a bit.

Soon it was whispered about the plant that a man's failure to meet the new tolerances would be a personal failure. How could it be otherwise, when no strings were tied on the equipment he would be given, once it was shown that new equipment was necessary? At the same time, every man knew that he had to "sell" the engineering department his reasons for asking for new equipment, and that new equipment, once ordered, must do the trick or else reflect against the department head who requested it.

The results were, of course, that old and worn-out machinery, jigs, tools, etc., quickly passed into the discard, and new and up-to-date equipment was installed in their places. Some of this new equipment so increased manufacturing efficiency, as well as accuracy, that one new machine in one instance replaced six old ones, and in another place one machine replaced four others. It was amazing to the old employees of the plant to see how badly the new equipment was needed.

Significant Savings from New Equipment

The immediate result of installing new equipment was a reduction of almost 15 per cent in the number of men in the plant, and a large reduction in manufacturing floor space required. The reduction in floor space was so great that it was possible to put all second floor manufacturing (about 15,000 sq. ft.) on the first floor, and to group it around the inspection department in a way to permit progressive manufacture throughout the entire plant. This allowed the manufacturing processes to start with the raw material at one point and move from department to department in a direct line to the shipping floor.

It was heartening to note the new interest which began to show itself throughout the plant when the new policies began to bring results. Ideas came from almost everyone. Some of the finest improvements in jigs and fixtures were suggested by workmen and foremen. And improvements are still coming in. Only recently the engineering department hit a snag on the design of an important tool which the company wished to add to its line. Someone spoke about it in the shop.

In less than two weeks one of the foremen brought a finished tool in working order to the chief engineer. It was just what the company wanted and, best of all, it was basically different from anything on the market and, therefore, patentable. Needless to say, that man was handsomely rewarded, as others have been who have devised practicable means to better the company's product, or reduce cost of manufacture.

Materials Testing Laboratory Installed

Skill alone will not make a good product, the material going into a product being equally important. Almost at the beginning the new management established a laboratory to test materials before accepting them. Today, every bar of steel which goes into the plant is placed in quarantine, as the plant calls it, until an end can be sawed off and tested. If it passes the test the bar is accepted.

Likewise, every tool used on the manufacturing floor is inspected for accuracy before it is accepted. Vigilance in these directions, together with the new and more accurate equipment and the feeling that rapidly grew on the men that they could do better work, has tended to cut spoiled work costs by almost one-half. Here again was a big reduction in expense.

The immediate effect of demanding closer tolerances on work was to reduce man-hour output. The management paid little attention to this until the shop was fully sold on its ability to live up to the new limits of accuracy. When that moment came the effort was made to speed up the work. Piecework was installed at rates which were attractive, and the output per man went up, as it always does when piecework on a proper plan is introduced.

Active in Sales and Engineering Development Work

While all the above was going on a powerful campaign to increase sales was in progress. New salesmen and service men (with emphasis on the "service") were put into the field. Others were put into the shop for training. New tools were designed and old designs were improved. In the last four years the company has put an entirely new and improved line of product on the market. The new line represented basically new

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JAMES WILLIAM HOOK was graduated in engineering from the Iowa State College. In 1916 *he became identified with the Allied Machinery Co. of America, which he served in turn as vice-president and president and through which he became prominently identified with the war activities of the American International Corporation, particularly in supplying the Allies with machine tools during the World War. In* 1923 *he became president of the Geometric Tool Co., New Haven, Conn., maker of precision threading tools. He has contributed to various business papers and in* 1919 *was the author of a notable paper read before the Foreign Trade Council at its Chicago meeting.*

features which were popular and patentable. The result was that the company's sales substantially increased.

I cannot run over this accomplishment of the company without paying a tribute to the engineering profession. A company nowadays cannot possibly remain up-to-date without good engineers whose entire duties are to design and try new things, and watch the advance of the art all along the line. One of the greatest achievements in the metal-working field in the last four years, I believe, has been the development of manufacturing to gage accuracy on a production basis.

In the company I am talking about the tolerances allowed today are, in many instances, less than one-third of what they were three years ago. Thousandths of an inch are, indeed, rapidly giving way to tenths of thousandths of an inch, without increase in cost to the user, or much increase in labor cost of the product itself. But a product made to such accuracy works well when it is sent into the field. This is attested, in the business I am telling about, by the great reduction in returned goods and in service expense. The curves of these last two items, even during the last 12 months, have fallen almost to the base line. Here is an example of where some added expense in the factory resulted in a greater reduction in expense in selling and servicing.

Today the mental attitude of the whole organization is different. It feels that it has accomplished results. It is proud of its ability to work to close limits and, what is better, it knows it can do it.

Only recently the management passed out word that a limit on one particularly important operation was too great and that it must be cut down. The men thought it would be difficult to do this and that closer limits would greatly increase rejections and cost. Before giving final orders it was decided to record the limits on the operation for a week, just to see how many pieces would not come within the proposed limits. Imagine the amazement of the workmen when it was found that approximately 98 per cent of the pieces were within the proposed limits anyway. This fact greatly pleased the men and made them feel that they could work to almost any limits.

Special Preferred Stock for Employees

The company lays great stress on employee relationship. Its major move in this direction was to create a plan whereby any employee could own a part of the business. This was done by means of an employee's prior preferred stock, which has the triple feature of being safe, always marketable, and participating, so far as earnings on the common stock are concerned. It regularly pays 7 per cent. It comes ahead of all other stock of the company in the matter of dividends, and of assets in case of liquidation. The company offers to buy it at par on demand. As excess dividends over 10 per cent are paid on the common stock, the employees' stock pays a proportionate additional amount up to 15 per cent.

Employees leaving the company for any cause, or desiring to sell the stock, are obligated to sell it back to the company at par plus accrued dividends. This keeps the stock in the hands of employees. Directors of the company are morally obligated not to buy any of the stock. Any employee can purchase his allotment, based upon his income, on a time-payment basis.

The stock has been liberally taken up but, unless its features are emphasized frequently, the tendency is for the owner to liquidate it. The average employee likes to feel absolutely independent, so far as his investments are concerned, and in many cases will sacrifice both safety and income to accomplish this. But the fact that the stock has been created and made available to all has had a fine effect upon the organization.

I have tried to crowd a great deal into a small space. I should like to show you the proposed success formula originally prepared for the business, and the final one as it turned out to be. There are, of course, a number of differences, and values are still shifting. But whereas one shifts in one direction, another always shifts in the opposite direction and, all in all, for equal volumes of business, the profit symbol "P" is still on the upward trend.

Third New England Conference

Comprehensive Research Program Urged at Springfield Meeting—Separate Sessions Held by Industrial and Other Groups

MORE than 850 representatives of the various industrial, commercial and agricultural organizations of the six New England States assembled for the third New England Conference, held at the Municipal Auditorium, Springfield, Mass., Nov. 17 and 18.

In addition to meetings of State delegates and of industrial and other groups, there were two general sessions, one of which was addressed by Secretary of Commerce Herbert Hoover.

Industry in Vermont Suffers $7,000,000 Loss

The session at which Mr. Hoover spoke was devoted to the New England flood situation, and his address dealt with the damage done in New Hampshire and Vermont, particularly in Vermont, and with rehabilitation of the flooded areas. Relating to the latter, it was said that this problem cannot be entirely forecast at present, because there has been so little time and opportunity to examine closely the volume and character of the disaster.

Preliminary estimates from various agencies indicate that the individual family losses in homes and furniture, and the destruction of cattle and tools and implements, was somewhere between $7,000,000 and $10,000,000 in the two States. The railroad loss has been estimated at $5,500,000 to $6,000,000 and the highway loss at about $7,500,000 in Vermont and $2,500,000 in Connecticut.

The losses to industry in Vermont are estimated at somewhere near $7,000,000, which figure will be increased by the losses of Connecticut and Massachusetts. It was indicated that the probable losses to Vermont alone would be of the order of $30,000,000—and that is spread over a population of less than 400,000.

Methods of rehabilitation were discussed, and in reference to the losses to industry and to business the factor of credit as a matter of rehabilitation from disaster was stressed. Following Mr. Hoover's address, a resolution was passed authorizing the appointment of a committee of 12, representing all of the New England States, to work out a program for advancing credits for the industries, mercantile establishments and agricultural interests of Vermont.

Outlines Purposes of New England Council

In addition to data relating to the accomplishments of the New England Council, an illuminating outline of the purposes of that body was given by its president, John S. Lawrence, president of Lawrence & Co., Boston, at the first general session.

"The first New England Conference came into being as the result of the joint action of the New England Governors," he said. "Two years ago our Governors felt that there was room for improvement in New England conditions, and a real need for the application of some new force to stimulate our thought and promote cooperation among us.

"A joint committee of 18, appointed by the six Governors, placed the problem before the first New England Conference (held in Worcester Nov. 12 and 13, 1925), composed of delegates representing the commercial, industrial and agricultural organizations of New England.

"The first action of those delegates was to establish the Conference as an annual institution, to bring

together the business leaders of New England at least once a year and to promote cooperation among them. The delegates at Worcester also created the New England Council and elected to it 72 men (12 from each State), with instructions to serve as an executive body to carry out the purposes of the Conference.

Problems Are Due to Industrial Maturity

"Two years ago we heard much of 'the New England problem,'" Mr. Lawrence said. "Your Council found that there was no 'New England problem' as such, but rather many problems which are shared in common by the six States—problems due partly to our economic and especially our industrial maturity, in part peculiar to our geographical situation, and problems which other sections will inevitably have to face in the years to come. The question before us was: How best to develop a New England consciousness of the common problem?

The method employed by the Council, it was pointed out, is to take up one specific problem at a time. "It has brought together groups of those most concerned with a particular problem, sought to inspire them with a consciousness of the problem, and then put them to work to find its solution. The Council has not undertaken, itself, to solve our problems; but it has endeavored in each case to enlist those best fitted for the job.

"It is neither the part nor the purpose of the Council to tell our manufacturers how to run their businesses, but we have endeavored to create in New England an atmosphere more stimulating to industrial enterprise, and to encourage industries with like problems to work together for their solution.

"The research committee of the Council has been the chief means of contact with and service to industry," said Mr. Lawrence. "This committee has particularly endeavored to establish a larger appreciation and use of research as a weapon in attacking industrial problems, both in production and in sales."

Extensive Research Program

The report of the research committee of the Council, which is headed by A. Lincoln Filene, general manager of William Filene's Sons Co., Boston, reflected comprehensive activity in the direction of cooperative research.

One of the major activities has been cooperation with the Department of Commerce in making two surveys. One survey is of all industries in New England, classified in 113 groups; the other shows the characteristics of New England as a market for its own and others' products. General data relating to regional commercial surveys, of which the New England survey is one, were given by Dr. F. M. Surface, assistant director of the Bureau of Foreign and Domestic Commerce, Washington, at another session.

Some of the data collected in this survey were on view at the exhibit of the bureau. These charts showed waterborne commerce of New England from 1920 to 1925; loaded freight car movement into and out of New England, etc. The complete survey will be published in sections in the next few months. One section will be devoted to ferrous metal manufacture, including machinery.

The committee has interested the Metropolitan Life Insurance Co., New York, in making a study of outstanding examples of the application of research by New England business. Data obtained from more than 300 companies cover the fields of production, sales, stabilization of employment and the use of economic statistics. A summary of the findings of this investigation was available in printed form at the meeting.

Other work of the Council's research committee has been the enlarging of its advisory committee on merchandising and advertising to 50 members, and an expert on marketing is to be added to the Council's staff. Mention was made, in the committee's report, of an offer from the New England sections of the American Society of Mechanical Engineers to cooperate with the Council in research activity, a survey of New England's manufacturing equipment being one of the projects under discussion.

An important accomplishment has been the establishment of an advisory committee of New England professional research consultants, headed by Dr. S. W. Stratton, president of the Massachusetts Institute of Technology. This committee is now engaged in a study of New England's opportunities in the aviation industry.

Other studies being made at the suggestion of the research committee include an investigation relating to the best practices of railroads in stimulating industrial and agricultural development along their lines; also, a survey of progressive practices employed by banks in extending financial and other aid to industry.

The group meetings of State delegations, held on the evening of Nov. 17, were well attended, the attendance at the Massachusetts section being more than 300. In addition to several addresses on the topic "The Viewpoint of Business on Taxation," the program of the latter meeting included an address by Col. F. H. Payne, president Greenfield Tap & Die Co., Greenfield, Mass., and president of the Associated Industries of Massachusetts.

Speaking on "Problems of the Present," Colonel Payne stressed the need for increased sales activity and greater sales efficiency. "It is time for greater selling effort and for more intelligent sales effort," he said. "We analyze our production costs, yet the analysis of sales cost is still a comparatively new idea. We should make our sales efforts intensive and specific, rather than desultory and haphazard."

Education in cost accounting, to teach producers how to determine fair selling prices, is needed, he said. While trade associations have taken up the subject of uniform cost accounting, there are many industries which have not been covered.

It was stated that "many New England manufacturers are not sufficiently sold on advertising to do it in a large way." Advertising, the speaker pointed out, is a part of merchandising and selling and "we must have as keen merchandisers and sellers as our competitors in other sections."

Sciences Provide New Tools for Management

Another address received with interest was that of Willard E. Freeland, assistant professor of marketing, Massachusetts Institute of Technology, and president Freeland & Warren, Inc., Boston, who spoke on "The Need of a New Attitude of Management."

Industry must grasp and use the "new tools" which both pure and social sciences are making available, said Mr. Freeland. The new attitude needed is one that sees and tests the new tools which lie at management's hand. Declaring that management "will be asked to forget the old, purely military conception of organization," Mr. Freeland said that the increasing complexity of business is forcing the development of functional management. The recognition of merchandising as a distinct function in industrial management was cited as an example of the tendency. Where formerly it could be taken for granted that a sales manager was in full charge of marketing, in many managements a vice-president in charge of marketing has been found essential "to coordinate the functions of selling, advertising, sales promotion, sales service, sales accounting, sales auditing, sales research, etc.

"Management will be asked to report to boards and bankers to what extent it is using research to protect the future of a business," he continued. "Management is expected to use research to keep abreast or ahead of competition. The highest technical skill in research is available to the 'little' business; it is not the monopoly of big business. It is inevitable that the microscope of research be turned upon the whole subject of marketing and that new methods, a new technique and better control be established.

"Management must attain a new attitude toward forecasting, and must learn to forecast sales. We are beginning to see the statistician sitting at the right hand of management.

"Another need for a change of attitude is toward regularization of employment. There is need for a new attitude toward industrial cooperation. By and large, management receives the same measure that it gives. Secrecy and selfishness eventually produce anemia in management, reflected all too soon by the pale color of the dividends of its business."

An outstanding paper of the industrial group meeting, held on the morning of Nov. 18, was an address by James W. Hook, president Geometric Tool Co., New Haven, on "Revitalizing a Business," given elsewhere in this issue.

To Promote Work for the Foundry

National Founders' Association to Appoint Committee for Research Into Additional Manufacturing Possibilities—Cost Accounting Also to Be Furthered

THE NATIONAL FOUNDERS' ASSOCIATION, holding its thirty-first annual convention at the Hotel Astor, New York, Nov. 16 and 17, decided to appoint two special committees, one to conduct a research campaign into the possibilities of promoting new work for foundries, and the other to study cost accounting methods with a view to furthering the adoption of practicable methods that will put the foundry industry on a basis of being able to figure its costs more intelligently. Appointment of these committees was left to the administrative council of the association.

William H. Barr, Buffalo, was again elected president of the association. The complete list of new officers and members of district committees will be found in a subjoining column.

President Barr in his annual message to the association spoke of the need of combatting the growth of communism in this country. He declared that there is little difference between communism and a labor union oligarchy.

Dangers of Communism Stressed

"The time is here when the 'open shop' must increase in effectiveness," said Mr. Barr. "It must seek to compel unionism to adopt a rational, natural and decent attitude toward the public interest. We have no fault to find with the desire of men who are workers in industry to promote their own interests. Unionism in theory is one thing, but unionism in practice has an unbroken record of violence, intrigue and deliberate purpose to substitute itself as the dominant power.

"It would indeed be a mistaken theory to assert that workers have no right to associate themselves for mutual protection and help. That is a question we may dismiss. But no two men or any greater number have a right to band themselves together for the purpose, not of protecting themselves, but of aggressively seeking to harm others for purely selfish reason.

"It may be said that a more intelligent leadership exists today. That may be true in some few unions, but it is not true of the greater part of them. Neither is it true that the present union leadership bases its activities on anything of a constructive nature. Its restraint, if any, is due to an expediency which is the result of a perfect understanding of the force and volume of public resentment which has been generated against unionism. Their leadership today is working for the sole purpose of bringing the labor unions of the country back into a position of dominance, and should this be attained we would find a speedy reversion to old time strong-arm methods.

"In the columns of the newspapers within the past year you will have noticed the prodigious amount of space used by the unionist leaders in their attacks on communism. They have challenged that group on every possible occasion, and sometimes have emitted loud expressions of contempt almost immediately preceding the adoption of resolutions demanding from the legislatures or the federal government trade union concessions which were themselves purely communistic in character.

"But while you may sense the purpose of unionism in this regard, do not forget that there is real work to be done not merely in preventing the growth of communism in the United States but in destroying it. It is insidious in its growth and unless watched it will grievously injure this great nation of ours. It has its tentacles extended into our schools and colleges and pulpits and newspapers and magazines and books. It is working through our stage and on our lecture platforms. It is stalking in the drawing rooms of society and in the living rooms of the workers. It is being injected into the farm problem and it has its devotees in legislative halls. It is subtle, dangerous and like morphia may become a habit that destroys."

Labor Situation Free From Strikes

Commissioner A. E. McClintock in his annual report referred to the calm which has prevailed in the labor situation within the past year. One member of the association, the Lindahl Machine Co., Chicago, operated an open shop which the union attempted to organize, but after four months the national union stopped paying strike benefits and agitation ceased. Discussing other labor developments Mr. McClintock said:

"For over five years the molders' union has been waging warfare against open shop foundries in San Francisco. During the past year the national union has sent to San Francisco $200 each week, charged as strike benefits, and in May, 1927, sent a special appropriation of $5,000 to assist in the defense of certain of their officers being tried for murder and conspiracy.

"An interesting situation has developed in the stove industry. The stove manufacturers in the South have been very largely on an open shop basis. The closed shop stove manufacturers of the North, however, for over 30 years have been entering into annual agreements with the molders' union, with the result that the introduction of molding machines and improved methods in their foundry departments has been greatly retarded.

"This difference in methods due to union influence has led to decided differences in cost of production. Several stove manufacturers (one of them a charter member of the Stove Founders' Defense Association), have closed their foundries and are reported to be obtaining their casting requirements from non-union foundries more cheaply than they can produce them in their own shops under the restrictive regulations imposed by the union.

"We have been informed that a large closed shop stove manufacturer in the North was discovered by the molders' union to be supplementing its union-made products by the purchase of its brand of stoves from Southern stove makers, completely finished and delivered to distributing warehouses. The reason for this is that closed shop stove foundries have been finding that they can buy their product completely manufactured and ready for shipment cheaper than they can produce them in their own shop under the terms of their contract with the union.

"This situation has been giving the national officers of the molders' union grave concern for many months. In order to protect their agreement with closed shop stove foundries in the North, they have been carrying on a vigorous campaign against the open shop stove manufacturers in the South.

"The activities of the molders' union have been particularly aggressive in the Chattanooga manufacturing district. During the past year, very close to $100,000 has been spent in strike benefits and organization work. The agitators for the union have had poor success in some shops in their efforts to organize the molders by peaceful persuasion. A reign of terrorism was then inaugurated. At frequent intervals, under cover of darkness, automobiles were driven past the homes of non-union workmen and the windows were shattered with shotguns.

"Although this condition of affairs has been going on for a number of months, the foundries attacked have been continuing in operation, and the indications are that law and order are being restored. The

molders' union, however, is still at the present time paying in excess of $1,000 a week for strike benefits in the Chattanooga district."

Changing Conditions Affect Membership

A reflection of changing conditions in the foundry industry was contained in the report by Secretary Taylor of a net loss of 10 members during the year, due largely to consolidations, companies going out of business or unprofitable operation necessitationg retrenchment.

L. W. Olson, Ohio Brass Co., Mansfield, Ohio, chairman of the committee on industrial education, told of satisfactory progress in the year in the development of apprenticeship courses both in connection with the foundry and in public school systems. In municipal schools marked advance has been made in Pittsburgh, Chicago and Cleveland. There has been a notable increase in the number of students selecting foundry work as their course of study.

James A. Emery, Washington, counsel of the association, discussed informatively the trade union reforms in Great Britain brought about by the adoption a year ago of the Trade Union Reform Bill. He cited the penal provisions of the bill for illegal strikes, for intimidation of workers and for picketing, the latter being permitted for observation only. Government employees are not permitted to belong to unions, except when made up exclusively of such public servants, but provision has been made that any who were members of a union having benefits of any kind is permitted to retain membership so that he will not sacrifice such beneficial rights.

Mr. Emery commented on the fact that Great Britain has adopted such stringent regulation of union activities, while at the same time organized labor in this country is campaigning for a lessening of restrictive legislation here, such as the use of injunctions in labor disputes.

George Gordon Battle, counsel for the National Better Business Bureau, Inc., explained the scope of the work of his organization and that of the local Better Business Bureaus and invited the cooperation of all business men in the prosecution of fraudulent practices, which, he said, are costing the people of the United States $2,000,000,000 a year.

General R. C. Marshall, Jr., general manager Associated Contractors of America, Inc., Washington, told of the encroachments of the Government upon private enterprise and gave numerous examples of the higher cost which the Government pays for some projects that like work has cost when awarded to private contractors.

Col. William Frew Long, general manager American Plan Association of Cleveland, explained in detail the scope of his organization and how it functions, following this with lantern slides showing the vandalism which has been practised in Cleveland in the building trades.

Industrial Education Shows Progress

L. A. Hartley, director of industrial education for the association, said that its interests now cover a wide range of subjects including apprentice training, personnel administration, foreman training, foremen conferences, foremen clubs, cooperative education, saving and thrift plans, group life insurance, budget plans for workers, home ownership, loan plans, profit sharing, cooperative stores, pension plans, safety, medical service, hospital service, nursing service, cafeterias, recreation, plant publications, and similar devices which have been found useful in developing the human factor in industry. He reviewed the field work of the committee on industrial education, which he said is meeting with a large measure of success.

Why Foundries Lose Money

E. T. Runge, Cleveland, cost accountant, gave seven reasons why foundries operate at a loss, these being as follows:

1. Instead of selling f.o.b. plant many foundries allow freight to the customer's plant. For a foundry melting 500,000 lb. of castings per month, he estimated a leak of $5,000 a year.

2. The 2 per cent discount for cash which some foundries allow amounts to 24 to 36 per cent in the

National Founders Association—Officers and District Committees, 1927-1928

President, William H. Barr, Buffalo.
Vice-President, C. S. Koch, Fort Pitt Steel Casting Co., McKeesport, Pa.
Commissioner, A. E. McClintock, Chicago.
Secretary, J. M. Taylor, Chicago.
Treasurer, Chicago Trust Co.

DISTRICT COMMITTEES

FIRST

New England States.

H. L. Steeves, Rhode Island Malleable Iron Works, Hillsgrove, R. I.
Nelson J. Darling, General Electric Co., West Lynn, Mass.
Alfred E. Hammer, Malleable Iron Fittings Co., Branford, Conn.
H. W. Hosford, Norwood Engineering Co., Florence, Mass.
Carl S. Neumann, Union Mfg. Co., New Britain, Conn.

SECOND

New York and that part of New Jersey north of a line drawn from Lambertville to Point Pleasant, and the Provinces of Ontario and Quebec in the Dominion of Canada.

C. W. Noble, Noble & Wood Machine Co., Hoosick Falls, N. Y.
J. L. Lonergan, Morris Machine Works, Baldwinsville, N. Y.
A. S. Macdonald, Snead & Co., Jersey City, N. J.
E. O. Buesing, McIntosh & Seymour Corporation, Auburn, N. Y.
William E. Van Horn, Otis Elevator Co., Buffalo.

THIRD

Pennsylvania, Delaware, Maryland, District of Columbia and that part of New Jersey south of a line drawn from Lambertville to Point Pleasant and including these two towns.

Thomas W. Pangborn, Pangborn Corporation, Hagerstown, Md.
C. H. Hoffstetter, Odin Stove Mfg. Co., Erie, Pa.
T. B. Wood, T. B. Wood's Sons Co., Chambersburg, Pa.
G. L. Coppage, Pusey & Jones Corporation, Wilmington, Del.
B. H. Johnson, Cresson-Morris Co., Philadelphia.

FOURTH

Lower peninsula of Michigan, Ohio, Kentucky, Indiana and West Virginia.

R. J. Redmond, Buckeye Foundry Co., Cincinnati.
William D. Hamerstadt, Rockwood Mfg. Co., Indianapolis.
W. L. Seelbach, Walworth Run Foundry Co., Cleveland.
E. S. Van Dalson, Dodge Brothers, Inc., Detroit.
J. Edgar Lee, Challenge Machinery Co., Grand Haven, Mich.

FIFTH

Illinois, Missouri, Oklahoma, Kansas, Nebraska and Iowa.

W. G. Jones, W. A. Jones Foundry & Machine Co., Chicago.
Walter R. Medart, Medart Co., St. Louis.
C. N. Stone, Deere & Co., Moline, Ill.
A. J. Hartley, Hart Grain Weigher Co., Peoria, Ill.
J. W. Bettendorf, Bettendorf Co., Bettendorf, Iowa.

SIXTH

Wisconsin, Minnesota, upper peninsula of Michigan, North Dakota, South Dakota and the Province of Manitoba in Canada.

Emil Viliter, Viliter Mfg. Co., Milwaukee.
F. H. Clausen, Van Brunt Mfg. Co. Horicon, Wis.
R. P. Teli, National Brake & Electric Co., Milwaukee.
C. S. Anderson, Belle City Malleable Iron Co., Racine, Wis.
Fred S. Power, St. Paul Foundry Co., St. Paul, Minn.

SEVENTH

Virginia, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Texas and Tennessee.

W. F. Tynes, Hardie-Tynes Mfg. Co., Birmingham.
D. B. Dimick, American Casting Co., Birmingham.
A. E. Hartwell, Hartwell Iron Works, Houston, Tex.
A. C. Jones, H. Wetter Mfg. Co., South Pittsburg, Tenn.
Charles R. Law, De Soto Foundry & Machine Co., Ltd., Mansfield, La.

Honorary Members of Administrative Council

O. P. Briggs, Minneapolis, Minn.

course of a year, and in a foundry melting 500,000 lb. accounts for an annual leak of $5,000.

3. On an average of 3 per cent returned castings, the allowances in a year for a foundry making 500,000 lb. a month total about $10,000.

4. Most foundries do not know how to figure melting labor. In a 9-hr. day there will not be more than 7½ hr. of effective work; therefore instead of figuring 80c. per hr., if that is the molder's hourly rate, the charge should be about $1 per hr. This, of course, does not include overhead.

5. Losses occur through figuring an average price per lb. The method of charging for every casting was recommended by the speaker.

6. Improper methods of figuring the costs of cored castings contribute a large leak in many foundries.

7. Selling a part of the foundry output at a figure below cost of production in order to attain volume, and hoping to recoup on the remainder of the output, leads to one of the largest foundry losses.

Following his talk, Mr. Runge was plied with many questions which indicated the interest of members in the problems of correct cost accounting. It may become the work of the committee on cost accounting which the association's administrative council will appoint to work out a standard method for foundry cost accounting adaptable to all types of foundries.

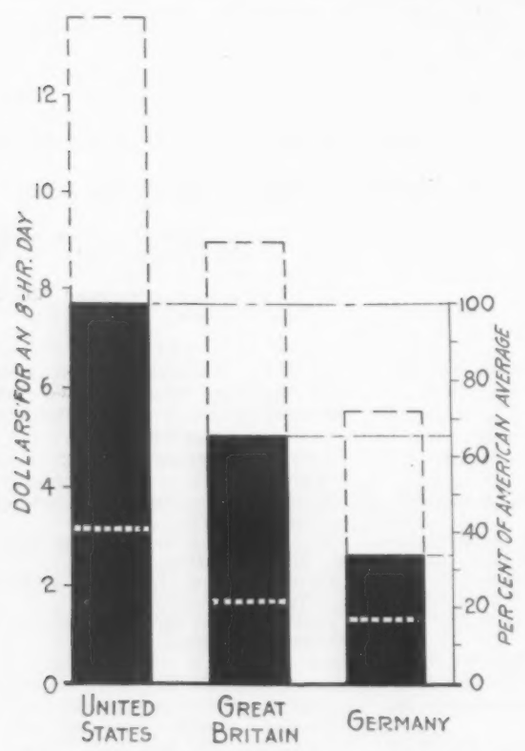
Officers of Other Associations Speak

S. W. Utley, Detroit, president American Foundrymen's Association, and Melville White, president Canadian Foundry and Metal Trades Association, made short talks. Mr. Utley outlined the scope of the work undertaken by the American Foundrymen's Association, which embraces the technical work of the foundry, as compared with the scope of the National Founders' Association, which embraces personnel matters.

Steel Mill Wages Here and Abroad

Comparative Figures for United States, Germany and Great Britain — Blast Furnaces, Steel Making and Rolling Mill

SOMETHING of a measure of the excess of American wages over those prevalent in Europe is indicated by data gathered by the United States Bureau of Labor Statistics. In the table are rates per 8-hr. day for the United States, Germany and Great Britain for a considerable number of occupations in connection with blast furnaces, Bessemer converters, open-hearth furnaces, puddling mills, rolling mills and tin mills. As gathered by the bureau, the figures showed the wages in foreign money. These were translated into American currency at prevailing rates of exchange.



Iron and Steel Daily Wages in Three Countries in 1926. Averages of a selected list are shown in full lines, with a ratio comparison at right. The dotted lines represent highest and lowest wages listed

In some cases the figures were reported as hourly, in others daily and others weekly. All of these, for our purpose, have been converted into daily rates on the basis of 8-hr. for a day and six days for a week. In cases where 10-hr. days are worked, the figure would have to be changed accordingly. In the few cases where the week is seven days, again a change would have to be made in the figure in our table. The data relate entirely to 1926.

In only five cases were comparable figures given for all three countries. These included blast furnace keepers, open-hearth melters, rolling mill heaters, rollers and laborers. A straight average for these five instances has been taken as the basis for our diagram, showing the general relationship of the three countries as regards iron and steel wages. Where a range is given in the table for the individual wage, the mean of the two extremes was used in preparing the diagram.

STEEL MILL WAGE RATES

Per 8-Hr. Day	United States	Germany	Great Britain
Blast furnaces:—			
Blowers	$7.20	$1.76 to $2.33	...
Blowing eng'rs.	5.28	.....	$3.24
Chargers	4.00	.....	3.80 to $4.50
Keepers	4.64	1.58 to 2.07	4.40 to 4.64
Laborers	3.12	.....	2.15
Skip operators	4.40	1.62 to 2.08	...
Stockers	3.76	1.31 to 1.58	...
Bessemer converters:—			
Blowers	10.88	2.21 to 2.90	...
Laborers	3.52	1.31 to 1.62	...
Regulators	7.60	1.93 to 2.98	...
Open-hearth furnaces:—			
Melters	9.36 (a)	2.17 to 2.74	8.98
Pourers	7.12	.....	4.18
Laborers	3.44	.....	1.64
Puddling mills:—			
Puddlers	6.16	.....	3.85
Puddlers' helpers	5.20	.....	2.31
Rolling mills:—			
Heaters	7.60 (b)	1.81 to 4.57	4.36
Rollers	13.60 (b)	2.19 to 5.52	5.50
Roughers	6.80 (b)	.....	2.67
Laborers	3.28 (b)	1.40 to 2.07	1.61 to 1.64
Tin mills:—(c)			
Rollers	13.12	.....	5.58
Doublers	6.32	.....	4.49
Shearmen	8.16	.....	5.32
Tinners	6.72	.....	4.01
Assorters	3.04 (d)	.....	4.89
Laborers	3.44	.....	1.79

(a) First helpers. (b) Bar mills. (c) Swansea, Wales. (d) Women.

Care in designing fire clay shapes is pleaded for in a bulletin of the American Refractories Institute, Pittsburgh. Cooperation between maker and user is given as the best means of obtaining satisfaction for both. Many suggestions are made in the bulletin (No. 16), which will be of aid in obtaining refractories properly suited to their purpose.

Extensive investigation of commercial stainless steel for use in rifle and machine gun barrels and other components is being carried on with the object of eventually making as many components of this type of material as practicable, says Maj. Gen. Clarence C. Williams, chief of ordnance, in his annual report.

Searching Tests of Welded Joints

Sponsored by International Acetylene Association in a Study of Pressure Vessels—Value of Various Gases for Cutting Flame Compared

EXPANSION of the uses of acetylene, thereby assuring a normal growth of the industry; increased allowable fiber stress at welds on unfired pressure vessels; revision of stress determination methods and caution in interpretation; and an outline of tests on welded, brazed and riveted tanks by the Bureau of Standards indicate the breadth of discussion at the twenty-eighth convention of the International Acetylene Association, held Nov. 16, 17 and 18 at the Stevens Hotel, Chicago.

Attendance, as reflected by a new peak in membership, established a record. Newly elected officers are: President, L. E. Ogden, Oxweld Acetylene Co., New York; vice-president, L. F. Loutrel, Shawinigan Products Corporation, Shawinigan Falls, Quebec, Canada; secretary-treasurer, A. Cressy Morrison, 30 East Forty-second Street, New York.

Publicity, research, the development of ideas and cooperation within the industry are the measures advocated in the presidential address by W. A. Slack, Torchweld Equipment Co., Chicago. Characterizing 1927 as a year of profitless prosperity, he issued warning that the practice of selling without profit, which is as much against the buyer as the seller, is a condition under which no industry can long exist. Although research is essential as a method for expanding the industry, nevertheless caution must be used that forward steps are thoroughly proved so that growth will be normal.

Tests at Bureau of Standards

Dr. H. L. Whittemore, Bureau of Standards, Washington, outlined the preliminary tests which are to be conducted by the bureau. The vessels are to be closed by means of rivets, brazing and welding, and three tanks of each specification are to be submitted for tests. One tank will be cut into specimens for physical and chemical tests. The second tank will undergo a pressure test starting at 75 lb. per sq. in. and advancing by increments of 25 lb. each to 50 per cent over the working stress, or to a total of 375 lb. per sq. in. The hammer test will then be applied and the pressure boosted by 25-lb. steps until rupture occurs. The third tank of each group will be submitted to the breathing test.

Among the tests that will be performed are: repeated bend, tensile strength parallel to and across the weld, and impact tests at the weld and on the base metal nearest the weld. Strain gage tests will be made at the longitudinal and head seams and on the base metal. The results will be of equal importance to the tests of welded structural members being made under the guidance of James H. Edwards, chief engineer, American Bridge Co.

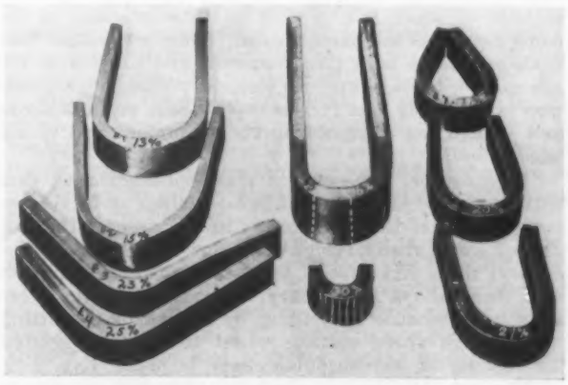
Construction of High-Pressure Tankage

Fiber stress of 9000 lb. per sq. in. in gas welds was shown to be entirely practicable by H. E. Rockefeller, Linde Air Products Co., New York, who described procedure and methods for "Welding Large Pressure Tanks," 6 ft. in diameter by 26 ft. long designed for a working pressure of 300 lb. per sq. in. Fire box steel, 1¼ in. thick, with a tensile strength of 50,000 lb. per sq. in. and containing 0.21 per cent carbon, was used. The form of the heads was nearly that of an ellipsoid of revolution. Both longitudinal and circumferential seams were of the double-vee butt type. Procedure control, he said, is of first importance in this work, which has successfully resulted in a product which withstood shop tests where the stresses were run up to within a small margin of the elastic limit of the material used. Constructional design, quality of material, preparation of the material and the technique of welders were given special consideration. It was necessary that each operator pass qualification tests on sample specimens.

The outer longitudinal seams were first welded. If the work was stopped before the completion of a seam, it was reheated for a distance of about 12 in. before again starting welding operations. This was necessary to relieve strain and to open the seam.

The manhole reinforcing ring was tack-welded into the head at four points, then preheated by means of a charcoal fire to a dull red. Two welders working 180 deg. apart closed one seam at a time. After the seam was completed on both sides the head was annealed.

Heads were attached to the shell by four short welds. Then two welders closed the head seam, working 180 deg. apart, one on the inside vee and one on the outside. During this operation the tank was rotated so that



Elongation at the Bend a Better Criterion of Quality Than Angle Between Wings

the welder kept the same position. Each welder worked for 20 min. continuously, when he was relieved; no interruption in the work was allowed.

City Gas vs. Acetylene for Cutting

In approaching the subject from the shop viewpoint, J. L. Anderson, National Carbide Co., New York, pointed out that a cut can be performed only at the rate at which the surface of the metal is preheated. Therefore the higher flame temperature resulting from the use of acetylene is an advantage which becomes more pronounced when the material to be cut is coated with an oxide or other substances that melt or fuse at high temperatures. It was pointed out that high flame temperature is particularly desirable when it becomes necessary to restart an old cut. Experience has shown that city gas is often quite satisfactory for new clean material, but that it requires a longer time for making a given cut and a larger amount of oxygen than does acetylene for old or slightly rusty steel.

The problem of the selection of a gas for cutting is largely one of a problem of preheating, according to J. K. Mabbs, Union Carbide Sales Co., New York. Depending upon the amount of oxygen used for combustion, flame temperatures from an acetylene cutting blowpipe range upward as high as 7100 deg. Fahr. The oxygen-acetylene flame actually shows the highest known gas combustion temperature, and is fully 900 deg. Fahr. above that of city gas. Laboratory studies show that a sharp edge of a clean ½-in. plate can be preheated ready to start cutting in 1 sec. by acetylene and in 2 sec. by city gas. Preheating for a cut on a

6-in. billet requires 3 sec. by acetylene and 10 sec. by city gas. On a rusty ⅝-in. boiler plate it is not possible to maintain a steady cutting rate with city gas. In cutting rivet heads the time required for acetylene was 6 sec. and the time with city gas varied from 13 to 25 sec. Laboratory results show that 30 per cent more oxygen is required with city gas than with acetylene. A conclusion drawn in this paper was that, all factors considered, the cost of cutting by acetylene is equal to or a trifle less than with city gas, the difference being more pronounced as the thickness of the metal increases.

Testing Welds and Welders

Dr. A. D. Risteen, Travelers Insurance Co., Hartford, Conn., stressed the point that a candidate for a job as a welder should not be allowed to enter the trade unless he has a liking for it and an interest in it. Supplementary remarks to Doctor Risteen's talk emphasized the fact that welders during the period of training and for a short time after will do first class work, but they may then lapse into a period of indifference or they may reach the conclusion that they are justified in developing methods of their own which may prove to be unsatisfactory. For that reason it was suggested that periodic examinations and tests are as essential with the experienced welder as with the novice.

Urging revisions in the methods of conducting tests, greater care in the specifications of conditions and caution in interpretation, W. B. Miller, Carbide & Carbon Research Laboratories, New York, addressed the meeting on "Mechanical Testing of Welds." Strength and ductility of welds have increased with the advent of special welding rods. This also permits stronger steels to be satisfactorily welded. Experience is teaching that per cent of elongation in 2 in. over the weld does not indicate definitely the quality of the weld metal unless perhaps fracture occurs in the weld. To get the whole story it is necessary to plot a curve of the extension in ½-in. increments over an 8-in. gage length. Instead of measuring the angle of bend in a bend test, it is better to measure the per cent elongation of the outside fibers. This gives comparative data when using a 1-in. gage length, and is a very satisfactory measure of quality in a weld. The figure shows how a 180-deg. bend may involve various degrees of elongation at the welded joint at the center.

Cutting Stainless Steel Castings

BY C. J. HOLSLAG*

A good deal has been written about the welding of stainless steel and the new rustless alloys. Each particular alloy has its own welding problem, the general solution of which is a deposit by suitable means of the same nature as the parent metal. Some are welded best with gas, some with direct current and some with the alternating current arc. In electric welding direct current is generally best for the copper base rustless alloys and alternating current for the chromium and nickel base alloys.

This article, however, is mainly designed to deal with the new problem which has arisen with the increasing use of this new line of alloys, namely the cutting of gates, risers, fringe and overflow in the castings. Several firms have found that it would hardly pay to cast these alloys if ordinary methods of cutting were to be used, because by drilling, by sawing, or by cutting with a high speed cutting wheel the cost of getting the casting to merchantable shape is prohibitive.

The arc process is admirably adapted to cut or "slough away" such excess metal, because of the fact that the invariably higher resistance of the alloy develops more energy at and in the arc than in common steel castings. Cutting is also facilitated by the longer time such metal is fluid in cooling, and by the fact that heat is not easily transmitted by conduction. A range of currents of 600 to 1000 amp. will eat into any such casting.

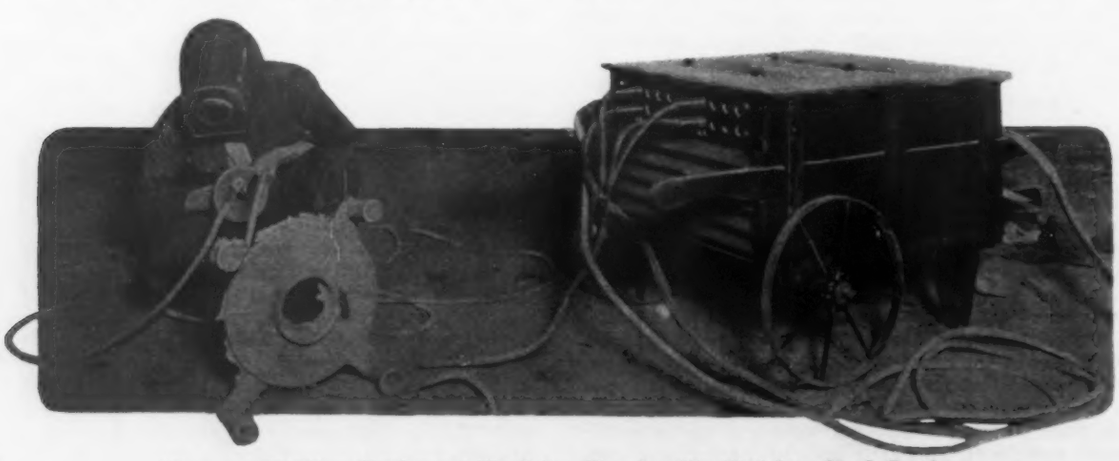
Since these castings are tough and hard, good tools are worn out by them more rapidly than by anything else, except perhaps chilled cast iron. Gas is useless for cutting many of the alloys, but with the alternating current arc process it is easily accomplished. Not only can gates, risers, fringe and overflow be cut off very quickly with the minimum power, but the castings can be smoothed so that very little grinding has to be done, and this without changing the temper or quality of the casting at all.

Most castings are made in electric furnaces. This brings in the fact that electric power for cutting is easily obtainable from practically every point where such a casting would be made. The machine shown for transforming current is adapted for all welding as well as cutting, and has various taps for light work, for use of slag covered or flux coated electrodes, and for large electrodes for medium and heavy work.

*Electric Arc Cutting & Welding Co., Newark, N. J.

Form Granite City Steel Co.

The National Enameling & Stamping Co., Granite City, Ill., has segregated its steel works division to form a new company to be known as the Granite City Steel Co. It is owned entirely by the National company, but will be operated as an individual unit. George W. Niedringhaus and Alfred J. Kickhefer, respectively chairman of the board and president of the new company, hold similar positions in the parent company. Hayward Niedringhaus, vice-president and general manager of the new subsidiary, is a director of the National company. Laurence F. Miller, vice-president in charge of sales in the new organization, has been manager of sales in the steel works division of the parent company for three years, and previously was assistant manager of sales at Pittsburgh and later at St. Louis for the Carnegie Steel Co. Other officers of the new company are C. M. Fox, secretary and treasurer; Wesley A. Martin, assistant secretary, and Robert Miller, assistant treasurer.



Alternarc Welding Equipment Used for Cleaning Up Stainless Steel Casting

Gray Iron Foundry Faces a New Era

Engineer Declares That New Methods in Preliminary Stages of Development Will Make Possible a "Come Back" Commercially and Scientifically

BY E. A. CUSTER, JR.*

JUST when the gray iron industry as an industry could be said to have started is rather uncertain. We know that gray iron castings were produced as far back as 1300; we know that the first gray iron castings produced in the United States were made in Lynn., Mass., in 1642, but up to that time cast iron could hardly be called an industry. We can assume that it became an industry with the invention of the first cupola in France in 1722. From that time on the gray iron foundry progressed with extreme rapidity. By the time of our Revolutionary War it was recognized as the leader in all the fields of the metal industries, and it held that position with increasing value up to the Civil War.

It was due to cast iron that such inventions as the steamboat, the locomotive and all such kindred machinery were made possible, but from the days of the Civil War, the story was not such an interesting or creditable picture. In the fifties, due to the invention of Bessemer, steel made its appearance and almost immediately the supremacy of the foundry received its first body blow. Here was a metal that not only could be worked, forged and welded, but could also be cast in the mass, the same as cast iron. Then, rather than try to match it with any products of our own, our gray iron foundries stayed just where they were, and year in and year out we made no progress. The steel people made tremendous progress; they are responsible for our first chemical laboratories, our first testing machines; they bettered the product, learned to alloy it, learned to produce, as in later days, stainless, rustproof steel; in fact, steel for almost every building and mechanical requirement. Cast iron was still cast iron.

Business Drifted to Steel

Then they learned to quench, to form, to stamp and to shape by mechanical means, and we all know the tremendous potential amount of trade that drifted away from the gray iron foundries into the field of steel. On top of that, malleable iron made its appearance and the tremendous volume of work being produced today in malleable iron is evidence enough of an equally tremendous volume lost to the gray iron foundries.

If just the loss of the foundry trade were to be considered, it would not be so bad, but as steel became more dependable, so, by contrast, cast iron became less dependable. Engineers and designers throughout the country know full well that every one of our foundries has what we term off days, when, due to metal conditions, sand conditions or to weather or labor conditions, the product has a decided dropping off; these same engineers, rather than give the foundry the credit for the best it can do, take the worst we can do; they refuse to accept or give us credit for any fine grades of iron if any factor of safety depends upon it.

And, so, as the engineers lightly slurred cast iron, in praising and using the other metals, their action seemed to react upon our foundries. Throughout the country foundries fell into what might be called a state of apathy; they were rather slow at first, and increasingly slow to accept new ideas, new thoughts, until in the commercial world as a whole, the foundrymen got to be known as in a rut, as unprogressive, as shellbacks; the last to take up most everything; the last in forming committees for research; the last in delving into their own product; or, to put it as one man said, foundries are a great deal like Squire Jones' racehorse: He named it Calliope, because it was always at the end of the parade.

Face to Face with New Era

Today we are literally face to face with a new era. If we shake ourselves out of the rut and awake and show the same progressive spirit the steel people and other people have shown, we can develop our foundries to a point where they will be second to no metal industry in this country or any other.

If we are going to consider, as we might say, the foundry of tomorrow, we must divide our consideration into three general topics: first and foremost, quality; second, economy; and third, quantity or rate of production. Naturally, given quality and economy, production will take care of itself. If we revert to the opinions of our engineers, they class cast iron today as having just two virtues that make it valuable: one is its economy or cheapness in price, and the second is its physical quality of rigidity; it is the only metal that does have real rigidity.

Would it appeal to everybody here as an ideal metal if you could take the rigid cast iron and add to it some of those qualities or all of those qualities possessed by other metals? Assuming, as practically every foundryman did a few years ago, that cast iron was cast iron, always had been, and probably always would be—that is the attitude that we seem to maintain.

Experiments with Gray Iron

In 1910 I was instrumental in producing an ordinary gray iron that could be tempered. I made tool steel quality bars out of ordinary commercial gray iron, annealed them, machined them into form tools, re-hardened them until in those days the hardness reading showed that they were harder than any steel on the market, and I used them for cutting cold rolled steel and I cut bands on shells with excellent results, except that they were extremely brittle and would snap under shock. Commercially, they were of little value, but it indicated that in the lowly cast iron there was one quality steel possessed, that of tempering.

Then, a year later I found that this same cast iron, when treated, would take and retain magnetism the same as steel, and hold it longer. Coming up to 1923, a new process of heat treatment was developed, where, by the heat treatment of cast iron, there is imparted to it some of the qualifications of malleable iron. I was connected with a company for a period of time where we produced—I am not exaggerating—cast iron bars that we could bend cold as far as 30 deg. and when heated we could literally tie those bars into knots.

So, once again, we find the lowly cast iron, when properly handled, possesses some of the attributes that belong to steel. A company was formed to promote that heat-treating process, but almost immediately it was abandoned because we discovered that the Germans, starting with so-called pearlitic iron, were doing all we could do and straight from the cupola without any heat treatment. They came over here two years ago and tried to interest American foundrymen. First they took their process to England and the English

*Foundry engineer. An address delivered before the National Founders' Association in New York, Nov. 16.

accepted it, and today the English foundries using pearlitic iron, 17 in number, are reporting such a volume of business that they can not meet their requirements and are selling the product at the same price as cast iron.

Tests on Pearlitic Iron

I saw some of the tests made on pearlitic iron at Columbia University; I saw a 1¼-in. pipe nipple put under hydrostatic tests. If we took such a nipple made in the ordinary way, we would test it to 250 lb. pressure. I saw those nipples tested to 2010 lb., when the pressure blew the gasket out and could not go higher, and that iron was poured direct from the cupola and with no additional metal.

Those Germans toured the country, talked to a number of the men here and tried to interest them in pearlitic iron. To be sure they charge a royalty. Whether or not it was the aversion to royalties, we do not know, but we do know they went back without succeeding in introducing it in a single place in this country. They continued their efforts in Europe, and France took it up, as did Italy, Denmark and even Czechoslovakia, and down in Brazil they adopted it, and still the United States, as far as I know, has done nothing.

Feasible to Produce Gray Iron with Quality of Malleable

Going further with their experiments, the Germans have been making a study of the eutectic properties of carbon in cast iron, and they state that it is entirely possible and feasible to produce various conditions of carbon in ordinary cast iron up to and including the type of carbon that appears in malleable, and to give to the trade in general an iron that will have all of the qualifications of malleable, with the exception of elongation. Not having the customary 10 per cent elongation, it does have 2 or 3 per cent elongation, which is sufficient for any use required of it. In addition to that, it has the element of rigidity. A more ideal iron could not be imagined—an iron that, in its strength, in its ability to withstand torsion, fatigue, strain and stresses, is equivalent to malleable and in some cases is equivalent to steel, has combined with it the rigidity of cast iron and with it the economy of cast iron.

Were we to turn over and produce such metal in this country, it does not take any great stretch of imagination to see what a tremendous amount of business could be brought back. I would not like to say that we could take 100 per cent of the work back from the steel companies or the malleable companies, but I say that we could bring enough back that the foundries of our country would stand predominant and supreme in the metal field.

That is only one of the things we can resort to in quality; but if we are going to look forward to the day when we are going to get that, if we are going to look forward to the foundry of tomorrow, we have got to look forward to the day when all of our foundrymen will be foundrymen of tomorrow, out of the rut and up on their toes, digging. How then can we start in our foundries of today? Turn them over to the foundries of tomorrow.

Improvements Needed in Melting Practice

Look at the way we melt. How many know the exact temperature of the molten iron coming out of our cupolas? How many know what they could do if they altered that temperature? I can best give an example by telling you what was done at the Baldwin Locomotive Works in Philadelphia. They installed pyrometers on their cupolas, ascertained their melting temperature, then when they wished to increase the temperature, they had to pay more serious attention to the cupola operation. They balanced their flame condition, their ratio between fuel and oxygen; they ascertained that they were getting a maximum of CO_2 gas in the high combustion chamber and a minimum of the CO gas in the lower combustion chamber. They jumped the temperature of their iron from 100 to 200 deg. as it came out of the cupolas spitting hot, and it cost nothing for the pyrometers to make that change, yet as the direct result of that change they cut their daily casting loss exactly in half.

Now that we are on the subject of melting, I want to just say a few things about the possibility of powdered coal for melting. Powdered coal lately sprang into existence; it has been used by the steel people and is extensively used by the malleable people, and the foundries are trying to use it for the cupolas. The reason is, first, that we can always maintain a neutral flame, neither carbonizing nor oxidizing, at the maximum temperature of 3500 deg., and we can always be sure that we are not injuring the quality of the metal or the character of the melt. On top of that, where we get today a 6 to 1 ratio in the metal, by using powdered coal it is estimated we get from a 16 or 21 to 1 ratio, or literally cut our fuel cost in half.

Powdered coal cupolas are being worked on in the East and in the West, and the day that they are an actual accomplishment will be either set back or accelerated by the attitude of the foundrymen. If the attitude of the foundrymen shows that they are on the job and want powdered coal, it will come quicker. One of the Germans who came over here to talk about pearlitic iron, said, "I talked to men in the foundries all over the United States and in almost every State in the eastern part of the United States and a few in the West, and although I was in various States, I am inclined to think that all foundrymen are from Missouri."

Pearlitic Iron to Be Made Here by Germans

That attitude is the attitude that we have got to lick if we are going to realize anything that is possible for the future. I do not want to advocate pearlitic iron; I do not want anybody to think that I am booming pearlitic iron, but those Germans are coming back here in the spring and they announce their intention of organizing the Pearlitic Iron Co. of America and floating it here. They stirred up an agitation while they were here, and quite a few people tried to fathom the process themselves and were partly successful, but nobody ever pushed it to a finish.

I would not like to think that, with our tremendous financial resources and our manual resources as compared to European, we are also mentally inferior to them. Nothing would please every foundryman here more than to have them come over in the spring and find out that we were using that same process and bettering it. If they can do it, we can do it; that is not a fantastic dream.

Synthetic Sand Offers Possibilities for Saving

Setting aside quality, or rather as an attribute to quality, what are the reasons that cause losses in the foundry? First, probably the greatest cause of our losses in the foundry is sand trouble and sand condition. Every foundryman knows and every sand dealer knows, if they are honest with themselves, that Mother Nature does not provide sand that runs uniform and true day in and day out. They try to overcome that by blending three or four sands together so that variations in one will be partially overcome by the others. As far back as 1917, the question of synthetic sands came up; they have been worked on and played with, and with the aid of our laboratories and microscopes, we know exactly and precisely what constitutes the exact grade of molding sand we want for every different purpose. It is fair to say that, inasmuch as sand is nothing more or less than a mechanical mixture with very little or no chemistry entering into it, it should be just as easy to produce that same sand from its ingredients as we produce so many other things synthetically.

It has been tried in various places. At Providence, R. I., I happen to know that they went into it extensively. They combed the Atlantic Coast up and down for the proper grade of sand to use, a sand that under the microscope would show the minute grains to be nearly round and not broken and jagged. They took their analysis of what constituted a good sand, mixed that sand, used the new humidifiers to determine the moisture, and after a number of experiments finally developed a type of sand muller similar to our ordinary mullers, with some slight changes in the shape of the blades and arms, and produced synthetic sand and used it to immense benefit in the foundry and are using it today.

There is no reason why every foundry in the United States cannot do the same thing. It does not mean a tremendous expense, and the savings are ob-

vious. We do not need any paper and pencil to figure out how much can be saved by eliminating and crossing off of the red side of the ledger every casting that in the past has been lost due to faulty sand.

I do not think it is necessary to say much, if anything, about molding machines and methods of molding; they are varied and there are so many of them, some excellent for one purpose, some for another, and all of them having excellent points. But this much is assured: given a precise quality of metal and a precise grade of sand, any form of molding, whether it is hand molding, jolting, ramming, squeezing, slinging or gravity, can be adapted with tremendously beneficial results to synthetic sand.

Blowing Sand Into Cores

The thing that might be interesting is experiments that are going on in the use of blowing sand into molds, the same as we have been doing for some years, and blowing them into cores.

That has been tried in a number of places. Progress is being made on it in the same development stage as the powdered coal cupola. Its success is going to depend entirely on those who are going to use it. If this process is received, if the experimenters receive encouragement by knowing that there is a warm reception awaiting it, it is going to be accomplished that much quicker. If they know they have got to buck up against the same opposition the molding machines had to buck up against at the beginning, when foundries had to be forced to accept them, its accomplishment is going to be that much further away.

The Permanent or Long-Life Mold

If we are going to look forward to the foundry of tomorrow, somewhere in our thoughts is going to be the permanent mold. It is wrongly named permanent mold, because there is no such thing as a permanent mold. It should be called a long-life mold. The subject is too big and broad to explain fully here, but there are a few things I would like to say about it. The permanent mold never will be a cure-all for foundry troubles. There are a tremendous number of castings that never can be made in permanent molds, but there is an equally large number adaptable to it. It depends entirely on the design and method of operating the mold. Throughout the country the chief objection, the chief reason why it has been discarded so many times is because it leaves the casting with more or less of a crystalline surface. When permanent molds were first brought out, a number of things were discovered. First of all, if we could imagine a cross line chart for degrees of temperature in the horizontal and degrees of expansion and contraction in the vertical, and if we take our molten cast iron as the starting point, then when cast iron starts to set, and not until it does start to set, does carbon segregation set in. As the carbon segregation sets in, it causes a series of three expansions. For practical purposes it can be taken as a single expansion. Starting from the point, as it cools, it expands upward a given distance according to the grade of iron, holds that for a short while, then comes down again, passes across the point of its original volume and shrinks on down.

In taking this into consideration with a permanent mold, where you have metallic cores or things that must be drawn out of the inside when it reaches the peak of expansion, (this can be charted and ascertained for any single type of casting), many internal cores can be drawn out absolutely free without any gas at all. I drew 5 ft. lengths of soil pipe out of an iron core 5 or 6 ft. long without a shadow of gas. As the cast iron comes down to its original volume, the mold should be opened and the casting exudes. At a point below the line, which is exactly the same distance as the iron expands above the line, the chill point sets in. No chill will occur in a casting until it reaches that point.

If we are going to consider permanent molds, it can be seen that if a mold is so built and operated that the castings can be handled and taken out in that time before it reaches the chill point, there will be no chill in the casting, there will be a close, rather coarse grain, very strong iron, devoid of any chill whatever, machinable all over. At that point the duration of time is the one thing that gives the trouble, and in the light, thin casting, the expansion and contraction are so quick that it is almost impossible to get in in time to prevent chill.

Heat Treating Necessary with Permanent Mold

If we wish to use the permanent mold, some form of heat treating must be followed. On heavier castings the time is longer. I have made molds for castings, everything from little tackhammers for the Woolworth stores to railroad car wheels for the Pennsylvania Railroad. A tack hammer's time is but 1¼ sec.; a railroad car wheel's time is 1 min. 20 sec.

If anybody is seriously considering the permanent mold, he must make up his mind, first, that no mold is going to go off smoothly and easily on its first try; every mold is going to require study, care, patience and no doubt considerable expense until the actual time of operation is determined and the mold is so designed that the casting will fall out freely and quickly; then we have something which is more than valuable in the foundries. The labor cost, in direct labor only, in my experience on the use of permanent molds, was $2.47 to produce castings in sand and 87c. to produce them in permanent molds.

Getting back to sand conditions, I would not like to

What "The Foundry of Tomorrow" Will Do to Rejuvenate Itself

1. *It may adopt pearlitic iron, a German discovery, which the Germans themselves may introduce commercially in this country in the spring by the formation of the Pearlitic Iron Co. of America.*

2. *Experiments now being conducted in Germany may make it feasible to produce various conditions of carbon, thus giving the trade an iron with the qualities of malleable iron except elongation.*

3. *The foundry may adopt improved methods of heat control, thereby cutting casting costs.*

4. *It may adopt powdered coal for fuel in the cupola, cutting fuel cost in half.*

5. *It may adopt better methods of sand conditioning and the use of synthetic sand, already quite widely used in Europe but in this country only to a small extent. Large savings are said to be possible by improving sand quality.*

6. *The blowing of sand into cores is still in the development stage, but promises important results if its ultimate success is assured by encouragement of foundrymen.*

7. *Adoption of the permanent or long-life mold, while not cited as a cure-all for foundry troubles, promises savings in the making of the type of castings to which it is suited.*

8. *A method of cleaning castings by the use of the hydraulic washer using sand as an abrasive with the water, soon to be placed on the market, is declared to offer possibilities for economy.*

say just how many of our foundries are really operating under extremely poor sand conditions. The cost of producing synthetic sand must be recognized throughout the country for the simple reason that a new material which is getting some big sales is nothing more or less than a clay bond applied to worn out sand to revive it and bring it up. It is synthetic sand and a small percentage of real achievement. If we can go part way, what is to stop us from going all the way, eliminating every trouble in the foundry?

Sand Conditioning by Machine Cuts Costs

Where a laborer is shoveling sand at 40c., 50c. or 60c. per hr. it is perfectly feasible to supply the machines that will do it at a fraction of that cost, and do it better, more certainly, surer and faster. To give you an idea what can be accomplished in that way, I put a machine in the foundry for conditioning sand; there were 36 molders working in that foundry and as far as I could determine, every molder had his own way of making the sand. I determined what I thought was the best sand for those conditions, and we had a machine put in to prepare that sand. Up until that time these molders had used an average of four wheelbarrow loads of sand a day; the machine produced better sand than before and a sand that immensely facilitated molding and they used eight wheelbarrow loads in a week. The saving in sand alone soon paid for the machine itself.

All of those things that come within the province of the engineer, that are going to come to the foundries and are coming today, need no explanation. But one thing that does come into the molding is the facing we use for two purposes, one to provide a clean, bright looking casting, the second, to prevent the sand from burning or adhering to the casting. How much money could be saved in every foundry if it had a method of cleaning that would clean the casting much cleaner, brighter and smoother than has ever been done heretofore, irrespective of whether facings were used or not? If facings are cut down to a minimum, how much could be saved in their cleaning?

Hydraulic Washer for Cleaning Castings

Some years ago the hydraulic washer for blowing out cores was tried. It proved immensely successful for coring out the hard backed cores and cleaning out the inside of castings, but for cleaning the casting it had no value whatever; if the sand adhered, the water would not remove it. This year a combination was practised with that hydraulic washer, a simple method of mixing in an abrasive in the form of sand. It was tried out and found to be tremendously successful. It is being developed now. The probable date for it to be put on sale will be some time the first of next year. Whether it will be before that depends upon the desire of the foundries to get it.

An iron casting submitted to that stream of water for 10 sec. looked literally as though it had been nickel plated. A section of steel gate with sand burned in part of the way was put in front of a stream of water for 15 sec. and it looked as bright and shiny and clean as though it had been filed throughout. These machines are going to be provided with big turntables for big runs, and with smaller benches for small work, and with revolving barrels for still smaller work, where the work is simply put in at one end and carried through. As the sand and water are carried out, they go through sediment basins, which pick up the sand and carry it back to the point of contact. The sand is picked up by the water, so that the sand from one casting serves to clean the casting coming afterward. The saving is tremendous.

The quality of our castings is more than appreciated, but if we combine (1) a quality that is precise and exact, (2) a grade of sand and molding conditions that will eliminate the losses in the foundry, (3) a better type of molds, (4) economical conditions of sand, (5) a method of cleaning that not only gives us economy but the opportunity to produce a casting the appearance of which is really unbelievable—can a more ideal foundry be imagined or painted or pictured?

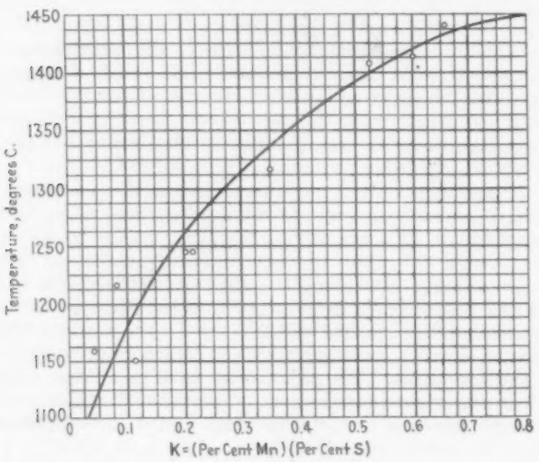
Greater Spirit of Aggressiveness Needed

There are many more points that could be touched on to the benefit of the foundry industry. If foundrymen will just show a greater spirit of aggressiveness and if necessary form committees like the steel people have formed, and go ahead with the same determination and hard work they have shown, it cannot be very long before every foundry in the United States is back where it rightfully belongs, not only predominant in the field of metallurgy, but on a happy, profitable basis. More than that, our foundrymen will be comparable to none in the world.

As things stand today, the Germans have beaten us on our grade of iron, the Germans are blowing molds with sand, the Italians are making synthetic sand, and the French are cleaning their castings, not so well as we can do it soon, but better than we are doing it. Is it not high time that we turned over and showed the foundrymen of the world that the American foundries can lead, not only as they do in volume of production, but in quality and economy?

Manganese Eliminates Sulphur from Iron Chiefly on Falling Temperatures

Makers of iron and steel have known for some time that an appreciable amount of sulphur is eliminated from high-manganese metal in the mixer. Recently C. H. Herty, Jr., and J. M. Gaines, Jr., of the Bureau of Mines have studied the physico-chemistry of this reaction, and their results (as given in "Reports of Investigations," Serial No. 2817) indicate that this elimination is made as the metal cools.



Effect of Temperature on Solubility of MnS

These authors had previously advanced the theory that an inverse relation held between manganese and residual sulphur; i.e. at equilibrium conditions

$$Mn \times S = K$$

They proposed the value 0.070 for the constant K. More recent studies of a series of melts in a high-frequency induction furnace indicate that K is not a constant, but varies with the temperature, as shown by the accompanying curve. The authors recognize that this curve is true only for the particular slag which was present in their melts; it was formed when a 100-lb. charge of boiler punchings and petroleum coke was melted in a graphite crucible, with enough ferrosilicon to give soft iron, ferromanganese to raise the manganese content, and pyrite to introduce the sulphur. Furnace conditions were strongly reducing, owing to the excess of coke always present. In blast furnace operations, if any furnace slag is allowed to run into the ladle with the metal, oxidation will occur and sulphur will pass from the slag to the metal—or at least the chances of removal will be small—unless an ample layer of coke covers the metal at all times.

The curve shows that the view held by some operators that high manganese will eliminate sulphur under all conditions is erroneous. Only at relatively low temperatures does the solubility of manganese sulphide in iron become so low that any elimination of sulphur by manganese can be expected, except indirectly by assisting in other desulphurizing reactions.

Rolling of Hollow Staybolt Bars

Definite Economy Compared with Drilling—Sand Core Ejected by Compressed Air—Manufacture on Production Basis

MAKING seamless hollow staybolts has involved expensive drilling operations—expensive largely because of heavy breakage of drills and rejection of stock from holes not properly centered all the way through. These difficulties are being avoided by a hollow staybolt bar—rolled hollow at the Old Dominion Iron & Steel Works, Belle Isle, Richmond, Va. Thomas S. Wheelwright, president of that company, has obtained a patent for his method of making these hollow bars and has developed the system to the commercial production stage in sizable daily tonnages.

Briefly, the method consists in inserting a steel or iron pipe full of sand in the center of a built-up

Three Typical Sections of Fasces Are Shown Above, That at Left Being Composed of Two Semi-Cylindrical Plates Surrounding the Rods and Central Core of Pipe and Sand, the Whole Bound Tightly with Wire at Intervals Along Its Length. At right is the same assembly except that the plates are omitted. Narrow flat plates feature the octagonal form

Below Is Shown the Method of Blowing Out the Sand from the Completed Bar, by Means of Air at High Pressure, the Flexible Pipe Being Fed in Slowly by Hand as the Sand Is Removed

fagot of steel or iron rods, as the case may be, heating the entire fagot to welding temperature and rolling. The elongation of the billet compresses and elongates the core of sand, which is subjected to pressure, as well as heat. As a result, when the bar has reached the required diameter, which ranges ordinarily from ⅞ in. to 1 3/16 in., the sand core has a diameter of about 3/16 in. The sand has been very highly compacted and has attained a fineness comparable to that of flour. This core is removed by compressed air as described later.

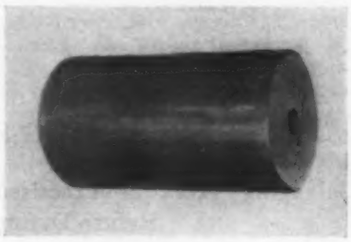
Made of Wrought Iron or Electric Steel

Both wrought iron made by the usual puddling process and steel made in the electric furnace may be used, and both are used as ordered. The fagot is made up with either two semi-cylindrical plates on the outside, as shown in one illustration, or with square or other exterior sections, as may be convenient. Each fagot has a considerable number of bars of known composition, rolled previously—again as shown in the illustration. The pipe of sand is plugged at both ends, but cropping the ends of the 45-ft. length

Table I. Tested Properties of Staybolt Bars

	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation in 8 In., Per Cent	Reduction of Area, Per Cent
Special Iron Fasces:				
Solid	37,400	50,600	31	50
Hollow	34,760	49,920	30	50
Electric Steel Fasces:				
Solid	38,590	54,975	31	54
Hollow	35,360	53,780	30	52
Electric Steel Ingot:				
Solid	40,560	56,750	32	61
Hollow	39,340	55,530	30	55

Section Cut from a Completed Hollow-Rolled Bar



eliminates the plugs. The bars are then sheared to lengths somewhat over 10 ft. for delivery to the saws, which cut them to the standard 10-ft. length.

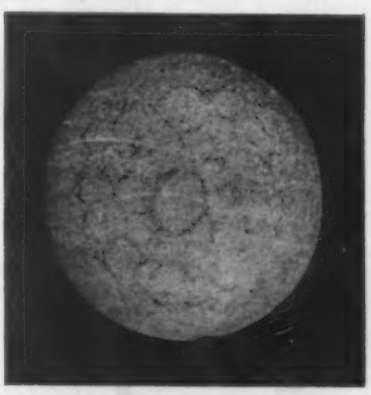
Rolling is accomplished on a two-high breaking-down mill, followed by a Belgian train of four stands, the first three of which are three-high, while the finishing set is two-high. After passing the bloom through the roughing stand for about nine passes, it receives five more in the Belgian train, thus being reduced from about 4 or 5 in. in diameter to the staybolt size. Specially designed passes in the finishing rolls are used, to preserve the contour of the inner hole.

After the bars are cooled they are cut off to accurate length by a battery of hack-saws fixed in position with the cutting edges just 10 ft. apart. They are then ready to be blown.

Getting Rid of the Sand

Each bar separately is chucked in a lathe and carried on suitable rests. Here it is rotated, while air

Solid Bar Made by the Fasces Method, Showing the "Finger-Print" Identifying Mark in Center



at a pressure of about 100 lb. per sq. in. is injected into the central core by means of a flexible brass pipe slightly smaller than the diameter of the core. A wooden box in which the blowing end of the pipe rests catches the sand dust and thus prevents it from going all over the room. The glass top in the box permits the operator to observe conditions as he runs the brass pipe gradually through the length of the bar. It takes from 2 to 3 min. to blow a bar. Lengths as great as 20 ft. can be blown by this means, simply by reversing the bar end for end after it has been blown halfway through from one end.

Tests recently made of this material have shown the results in Table I. Each figure is the average from a large number of tests.

In rolling the special staybolt iron by the fasces method the schedule outlined below has been adopted

as particularly suited to give the material the desired working and produce the required result. The puddle mill bloom, weighing about 175 lb., is given 10 passes, coming down to flat muck bars ⅝ in. thick and 3 in. and 4 in. in width. These bars then are piled six high—a total of 11 bars, using a 3-in. and a 4-in. width in each layer and thus breaking joints. Another 10 passes, after again reheating, produces a second series of ⅝-in. flats 3 in. and 4 in. in width. The secondary muck bars again are piled, this time eight high. Again heated, they are rolled in eight passes to 2¼-in. billets. After a fourth heating these 2¼-in. billets are rolled in 12 passes to ½-in. round fillers.

In this manner the fillers for the fasces have received 40 passes before going into the final form. The fagot is made up with two semi-cylindrical slabs, ½ in. x 6 in., on the outside, and 32 of the ½-in. round fillers surrounding the central pipe, which may be 1 1/8 or 1¼ in. in diameter. This fagot is then rolled down, as above detailed, to the final staybolt bar in another 15 passes or so. Thus the bulk of the material has received 55 passes between the bloom and the finished bar.

By this same method the special solid staybolt bars are made, the central core or pipe being replaced by a bar of staybolt iron 1 1/8 or 1¼ in. in diameter. This central bar, being larger than the surrounding fillers, can always be detected through the etch test, thus providing a means of identifying this material after long service. The etch test plate is analogous to the finger print used in identifying individuals.

RECLAIMING SCRAP

Salvaging Work as Practised at Several City Refuse Dumps

THE salvaging at city dumps of much iron and steel scrap which otherwise would be useless has been made possible by the development of bundling machines. Modern methods of waste reclamation adopted by the larger municipal governments have in several instances yielded revenue of a hundred thousand dollars a year or more. Washington, Philadelphia, Rochester, and other cities have installed up-to-date systems of reclaiming everything that goes to the city dump from paper and rags to old tin cans.

Waste reclamation is not without its romantic side. A story is told of an Italian, speaking and writing very little English, who, a good many years ago, sent an inquiry to a manufacturer of scrap baling presses. The salesman who followed up the inquiry found the man and his family living adjacent to the city dump in Brooklyn. The man bought one machine on the installment plan. His payments started at 20 cents a day and gradually increased to 75 cents a day. Then came a request for another machine and payments were made monthly. Finally the dump picker had bought 12 machines and then the city of Brooklyn bought him out and advertised for bids for the privilege of picking reclaimable material from the city dump. This Italian was the successful bidder, and he formed a partnership with another Italian, a New York contractor. The firm continued to expand. Power plants with conveyor belts were installed and warehouses were built where salvaged material was stored to await favorable markets. The firm became wealthy and one of the partners now has a large estate in New Jersey.

The waste reclamation plant in Washington operated by the United States Government reclaims upward of $100,000 worth of material annually, the principal items being rags and paper, but tin ware also produces a fairly substantial return.

In the reclaiming of tin ware the metal is passed through a revolving drum heated by waste gases from the incinerators, in which process the tin and solder are removed and the uncoated steel remaining is put up in bundles for remelting in steel plants.

Recent low prices for steel scrap have made the returns less attractive from the standpoint of profits, but the disposal of bulky material is always a problem to municipalities regardless of whether the material can be disposed of profitably or not. Such miscellaneous and bulky but light steel and iron refuse as is shown in an accompanying illustration can only be marketed if baled for charging into open-hearth steel furnaces. Another illustration shows material after it has been baled. The photographs here reproduced were obtained from Cox & Sons Co., Bridgeton, N. J., a manufacturer of baling presses.

WASTE Such as Is Shown in the Illustration Below Is Now Frequently Recovered From City Dumps

OLD Metal From City Dumps as It Appears After Going Through a Baling Press, Shown in the Above Illustration

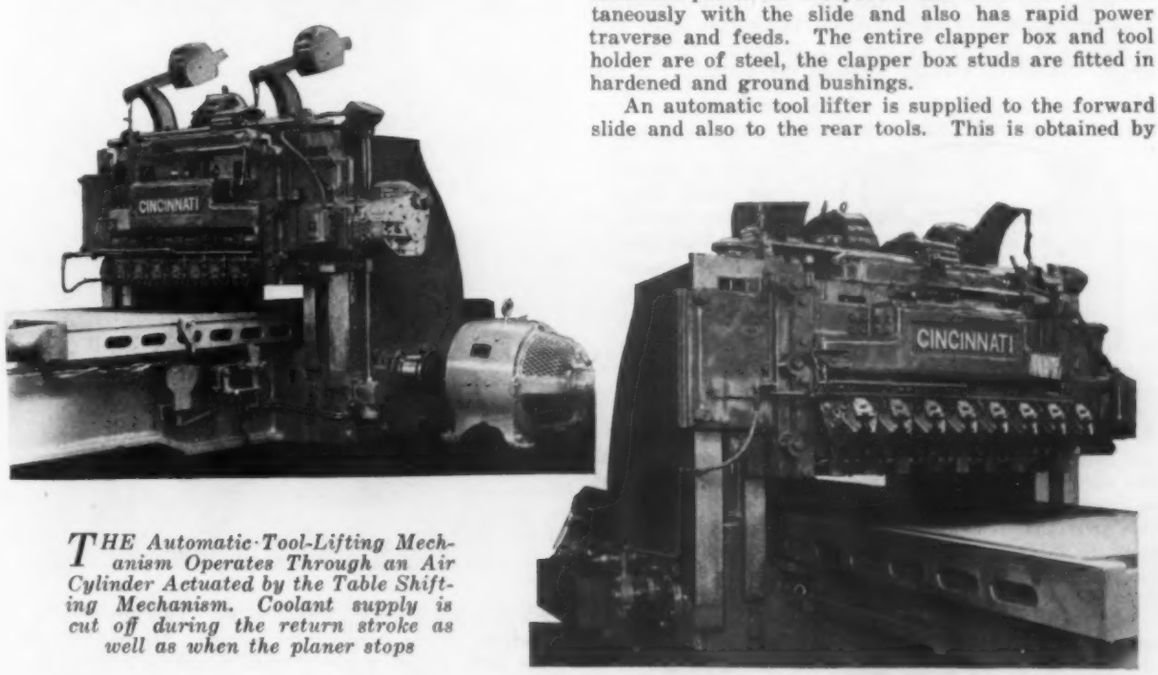
Eight Elevator Guide Rails Planed at One Setting

With 56 Tools at Work Production Is at Rate of Eight Rails in 25 Min. —Automatic Tool Lifter a Feature

EIGHT elevator guide rails, 16-ft. long, are planed at one setting on a guide rail planer placed on the market recently by the Cincinnati Planer Co., Cincinnati. The guides are planed on the sides and top. Seven cutting tools are required for each rail, making a total of 56 tools at work.

Although an 85-hp., 500- to 1000-r.p.m. motor is employed to drive the machine, the gearing is capable of transmitting 125 hp., if needed. With the 85-hp. motor drive the cutting speed is 90 ft. per min., and the return speed of the table, 180 ft. per min. It is claimed that at these speeds, eight rails can be finished in approximately 25 min., floor to floor time.

The arrangement of the machine may be noted from the accompanying illustrations. The length of the bed is twice that of the table. The Vees of the bed have forced lubrication, the same pump being used to supply oil to all bearings and gears. The gear section of the bed is made deeper to obtain additional strength. The table, of box-type construction, has an inner guide between the Vees and a table clamp on both sides, on the outside, the full length of the table. The table is designed so that the cutting lubricant will run into pockets, integral with the table, and is returned through a trough placed on the left-hand side. The gearing throughout is of steel, the pinions being of alloy steel, heat-treated, and the gears of high-carbon steel rings shrunk on steel centers. These gears are keyed to the shaft which revolves in bearings on the side of the bed. The gearing is sprayed with oil.



THE Automatic-Tool-Lifting Mechanism Operates Through an Air Cylinder Actuated by the Table Shifting Mechanism. Coolant supply is cut off during the return stroke as well as when the planer stops

Since the motors take an enormous overload and fuses do the same momentarily, a safety clutch was designed in connection with coupling so that in case of accident this would release, protecting both the tools and the machine.

The housings, of reduced height, are bolted to the bed and also fitted to a tongue which is integral with the bed. They are tied together at the top with the company's standard box arch. The rail is unsually deep and is provided with power movement up and down so that it can be adjusted for different heights of guide rails. The one-piece tool slide is full width of machine and slides on a narrow guide. Two screws are used for raising and lowering this slide, either by rapid traverse or feed. The rapid traverse is by the same method as the company's standard Hypro planer, using a reversible motor placed on the top of the machine and a control switch on the right-hand side of the rail. This controls the direction of the motor, giving the rapid traverse direction to the slide. Taper gibs are used throughout the rail and the slide. A stop handle is used to determine the initial height of the slide, so that after planing down the side of the rails, the rails can be rapid traversed to the positive stop; all that is necessary then is for the operator to start the machine after a new set of rails has been placed on the table. On the first pass of the planer table the tools will begin to cut. This stop can be thrown out of place so that when the rear tools need attention the forward slide can be run out of the way. The rear tools are placed in a separate bar that moves simultaneously with the slide and also has rapid power traverse and feeds. The entire clapper box and tool holder are of steel, the clapper box studs are fitted in hardened and ground bushings.

An automatic tool lifter is supplied to the forward slide and also to the rear tools. This is obtained by means of an air cylinder which is operated from the table shifting mechanism. The tools are raised high enough to clear the top of the guides.

Cutting lubricant is supplied to all tools by means of a pump placed on the left-hand side of the machine and driven from the main drive. When the planer stops the pump stops operating. There is also a valve in the line whereby the cutting lubricant is cut off on the return stroke. The oil is forced into a pipe across the top of the tool holders and is then led to each tool holder by means of a small pipe. It is pointed out that with this arrangement no more cutting lubricant is used than is necessary and lubricant is not wasted on the return stroke.

Officers of the Rockford, Ill., chapter of the American Society for Steel Treating were installed at the October meeting, the opening of the fall season. Dr. J. A. Mathews, New York, was the principal speaker at the gathering of 85 members. Swan Hillman, National Lock Co., is chairman for this year. Doctor Mathews discussed the "Importance of Chromium in Alloy Steel Metallurgy." He addressed a gathering of 95 members of the Moline chapter, preceding his Rockford engagement, and the following night spoke before the Chicago chapter.

Electrically Operated Hand Sprayer

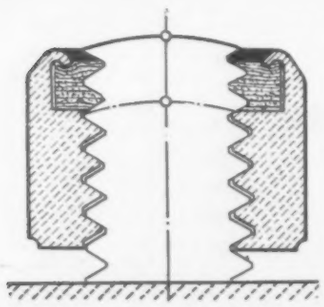
For spraying light-bodied paints, lacquers, enamels and varnishes, with minimum loss of materials, an electric spraying outfit has been placed on the market by the Electric Sprayit Co., 217 Iron Street, Detroit. It consists of a hand-sized motor-driven unit containing a fan run at high speed, driving air through the outlet nozzle at high velocity. Either liquid or powdered material is inspirated by the action of the air, the fluids being atomized at the nozzle. The motor of 110 volts operates on either a.c. or d.c. lighting or service lines.

Best results with liquids are reported when the nozzle is held from 7 to 10 in. from the work. Brass Venturi tubes in the air outlet nozzle are knurled, to permit accurate adjustment.

Safety Nut Uses Fiber Disk

A single locknut containing an elastic cushion or disk of hard vulcanized fiber is being put out by the American Gas Accumulator Co., Elizabeth, N. J. The cushion is riveted within the nut and is pierced with a hole somewhat smaller than the outside diameter of the bolt. It is not threaded.

When the bolt enters the nut and meet resistance from the cushion, this resistance translates itself into a backward pressure on the nut, as shown in the diagram. Thus the contact between the metallic nut and



As the Nut Is Turned Home Over the Bolt End the Threads of the Bolt Produce Corresponding Threads in the (Previously) Smooth Inside Surface of the Fiber Disk

the threads of the bolt takes place on those flanks of the thread which sustain the pressure, after the nut is drawn home against a support. It is claimed that this frictional resistance on the metallic flanks is sufficient to keep the nut from turning. As there is no play, the nut will fit tightly on the bolt, even if not drawn home.

In the illustration the disk shows threads. These are formed by the action of the threads on the end of the bolt at time of running the nut down hard.

Offers New Line of Fireproof Metal Windows

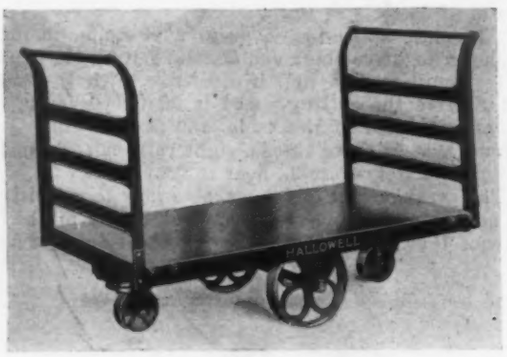
Protection against exterior fires and against the spread of interior conflagrations is offered by a new line of metal windows recently brought out by the Milwaukee Corrugating Co., Thirty-sixth Avenue and Burnham Street, Milwaukee. These windows, which have passed the tests of the Underwriters' Laboratories, are made of special stock No. 24 gage galvanized flat sheet steel. The pivoted, hinged, stationary, double-hung and counter-balanced types of windows are made, the pivoted, hinged and stationary types being made with one, two or three sashes to the window. The double-hung and counter-balanced windows are made with two sashes only. Combination windows are made on order in two or three sashes and in any size up to 5 x 9 ft.

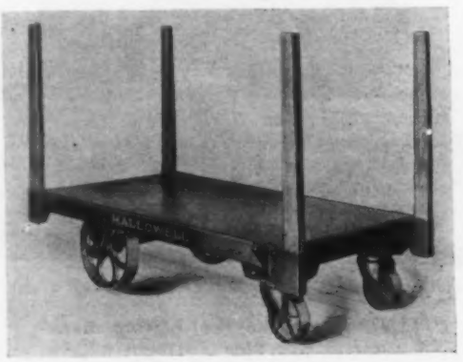
Production of bituminous coal in the week ended Nov. 12 is reported by the United States Bureau of Mines at 9,440,000 net tons, bringing the total for the year to 454,637,000 tons. While this is more than 6 per cent below the corresponding figure for last year, it represents about the average of the four years, 1923 to 1926 inclusive.

Flexibility in All-Steel Trucks

Industrial trucks of steel are being put out under the trade name "Hallowell" by the Standard Pressed Steel Co., Jenkintown, Pa. A single standardized chassis can be equipped with eight wheel styles and some 40 different body or rack designs. Two of the styles are shown in the illustrations, one featuring the tilting type of chassis, in which one of the small wheels is off the floor, while the other shows the non-tilting type. The illustrations show two of the numerous body designs.

Each chassis has a platform made from a single piece of heavy steel plate, with a deep integral flanged





Two of the 40 Styles Are Shown Here. Above is the tilting type of chassis; below, the non-tilting type. Many forms of racks are available

rib running around all four sides. This provides a stiff section, as the corners are welded. Instead of bolting the axle boxes, pressed steel brackets are welded to the underside of the platform to hold the axle. The swivel casters are bolted to strong pressed steel bases and welded in place.

Interchangeability has received special attention in the design. Wooden stakes, plain steel stakes, slatted steel racks on one, two, three or four sides, and bar handles, all may be fitted. Combinations of these may be used, if desired. Standardized fixtures for the corner attachment of all of these features are provided. Each corner has six bolt holes, three on each side of the corner, which are identical in all of the chassis.

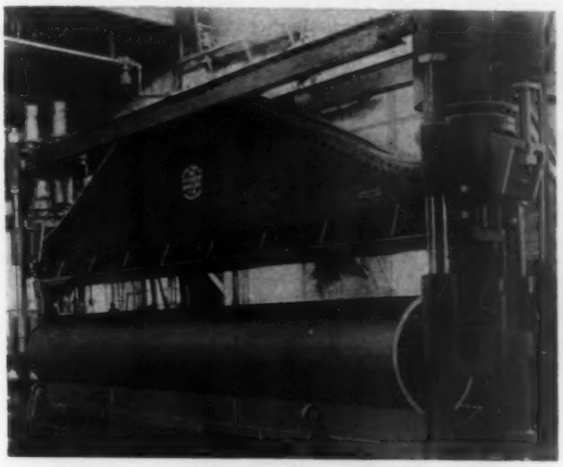
Labels containing the words "steel" and "cast steel," according to a statement issued by the Federal Trade Commission, were used by a company selling and distributing tools to advertise a material which lacked the constituent elements necessary to be properly designated as steel and through a stipulation proceeding the concern has agreed to discontinue such advertising unless the products represented actually are made of steel.

Builders of freight and passenger cars in west Germany have entered into a merger under the name Vereinigte Westdeutsche Waggonfabriken A. G. at Koln. The new corporation is composed of all West and South German car builders including such large companies as Van der Zypen & Charlier, Killing & Sohn and others.

Hydraulic Press Equipment for Forming Boiler Drums

The Wickes Boiler Co., Saginaw, Mich., has designed and built the large hydraulic press shown in the illustration. It has an open span between posts of 30 ft., and is capable of a pressure of approximately 3,000,000 lb. This machine was originally designed for flanging wide boiler headers, for forming butt straps and the ends of shell plates in one operation.

Increasing size and thickness of plate for drums in large water-tube boilers has exceeded the capacity



Bending Heavy Steel Plates into Boiler Drums, to Be Made With One Seam

of bending rolls to form the cylinders to small diameters. The practice has been to press thick plates in dies, by hydraulic pressure, to the proper curvature in halves or segments, requiring two riveted seams.

A method has been developed and perfected whereby a drum shell may be pressed from a single plate, with but one longitudinal joint, for drums of Wickes horizontal cross-drum boilers and curved-tube boilers. The company designed and fitted to the hydraulic press a large forged steel stake or mandrel, with special attachments for handling. The mandrel is 36 in. outside diameter, weighs over 100,000 lb. and is made of an alloy steel with a tensile strength of over 100,000 lb. per sq. in. Cast steel forming dies rest on the lower platen of the press.

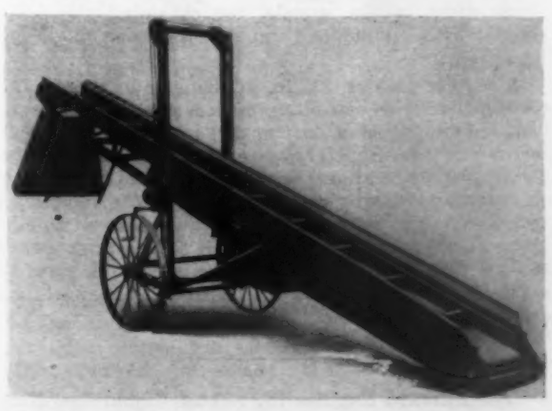
The illustration shows in the press a shell, the forming of which has just been completed. This drum shell for a three-drum curved-tube boiler is formed from one plate. It is 48 in. in diameter, with a thickness of 1⅞ in. and approximately 29 ft. long.

Lightened Frame in New Portable Scraper Conveyor

A new portable scraper conveyor for handling coal and coke, and differing from its previous models in reduced weight of frame, increased size and strength of conveyor chain and larger screen chute, has been brought out by the Jeffrey Mfg. Co., Columbus, Ohio.

This scraper, designated as the new Drag-On, weighs 1100 lb. less than its predecessors, and the reduced weight, which makes the machine easier to move about, is gained by lightening the frame and shortening the mast. It is claimed that, although the frame is lighter, the various parts of the machine are stronger than in the previous model. The conveying chain is the combination type Jeffrey 188 Hercules. The flights, of ¼-in. steel plates, are L-shaped and extend the full width of the trough. The bottom plates of the loading end of the trough are also of ¼-in. steel.

The screening chute is 3 ft. long and gives 6 sq. ft. of mesh for taking the fines out of coal while loading. The wheels are 4 ft. in diameter, have 3-in. wide tires and are swiveled to turn in either direction, permitting the machine to describe a complete circle around a fixed loading point. The wheels are bronze bushed and pressure greased. Power is supplied by an electric motor equipped with anti-friction bearings. For raising or lowering the discharge end of the conveyor a worm-geared winch pulls a cable over the top of a short rigid mast. This winch, as well as other units, is high-pressure lubricated.

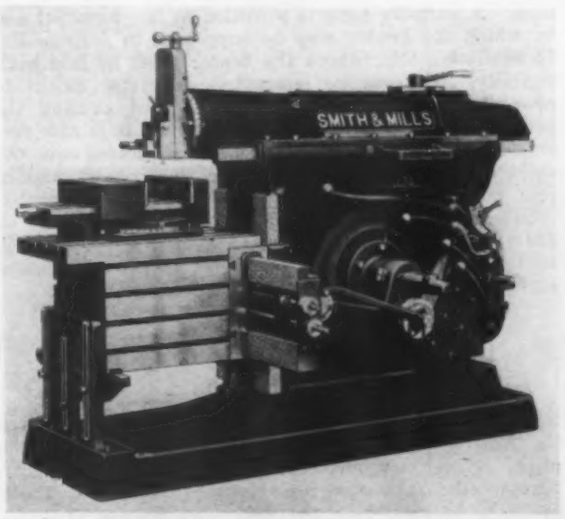


Wheels Are Swiveled to Turn in Either Direction, Permitting a Complete Circle Around Any Point

32-In. Back-Geared Crank Shaper

The Smith & Mills Co., Cincinnati, has added to its line a 32-in. back-geared crank shaper. The machine is regularly furnished for single-pulley drive with twin disk clutch and self-acting brake, although motor drive arrangement can be furnished if desired. In the latter arrangement the motor is mounted on a pad which is bolted to the base of the machine.

The column of the machine is heavily ribbed and ram ways are reinforced and fitted with felt inserts connected to an oiling arrangement. The ram has



Heavy Construction Is a Feature Stressed. Lubrication is by means of a one-shot hand-operated lubricator

square type guides. The crossrail is of box form and the bearing surface is arranged so that the apron and table do not overhang on the feed side. The rail screw is of chromium steel with Acme thread and is operated by a nut which is anchored to the apron with a tongue. The table extends over and bears on top of the apron, which arrangement is intended to increase rigidity, relieve strain on the clamping bolts, and to increase the working surface of the table.

The rocker arm is of semi-steel and mounted on a pivot shaft at the bottom. The sliding block is of semi-steel and bronze bushed. The bull wheel is also of semi-steel and has cut teeth of helical form.

The speed box, bolted to the back of the column, provides four changes of speed which, with the back gear drive, gives eight different cutting speeds to the ram. Speed changes are controlled by two conveniently located ball levers. Gears are of alloy steel, heat treated and hardened, and the teeth are rounded to facilitate

meshing. Sliding gears are broached and slide on multiple splined shafts which are mounted on tapered roller bearings.

When arranged for single pulley drive, the pulley is mounted on tapered roller bearings. The disk clutch is controlled by a long ball lever at the operator's side.

Lubrication of the machine is by means of a one-shot hand-operated lubricator, which supplies oil to all main revolving shaft bearings, ram ways and other parts. This system includes a supply tank, pump and distributing units or headers. The volume of oil delivered to each bearing is determined by the size of the air control chamber installed on the header for the particular bearing. There are three distributing units and 18 outlets. The pump is located on the outside of the machine.

When the motor drive is used the drive is through a fiber pinion on the motor shaft to a large gear on the driving shaft of the shaper. Some of the specifications of the shaper are: Extreme length of stroke is 32¼ in.; maximum cross motion of the table, 32¾ in.; total vertical adjustment, 15 in.; distance between the table and the ram, 2¼ in minimum and 17¼ in. maximum. The net weight is approximately 6500 lb.

Electric Mold-Drying Unit

An electric heating unit for drying large sand molds in brass, steel or iron foundries has been designed by the General Electric Co. to obviate the attention required by the kerosene lamps, stoves, coke or coal fires usually employed. The electric device consists of a helicoil, sheath-wire unit cast into iron. The terminals are protected by a cast-iron cap with an insulated hole in it, through which wires may be brought. Asbestos lead wire is recommended for use with the unit, to withstand heat.

As the electric unit will operate directly across the line voltage, any number required in a mold may be used. A suitable hook is provided at the terminal end by which the heater may be supported in deep molds. In shallow molds, where the heater must be laid horizontally, it should be supported on metal blocks to prevent its touching the sand and thus causing the heater to over-heat and spoil the mold. It is also recommended that a sheet metal cover be placed over the mold during drying, to speed up the process and to reduce heat losses.

The new unit is rated 1250 watts, at either 110 or 220 volts. It has a shipping weight of approximately 10 lb., an overall length of 21 in; length of heating surface, 18 in.; width, 2¼ in., and thickness, 1 in.

American Radiator Acquires American Blower Co.

The American Radiator Co., New York, has acquired the American Blower Co., Detroit. The organization of the Blower company will remain intact and the business will be conducted by a new company which will probably be known as the American Blower Corporation. The company has been in operation for more than 40 years and manufactures heating and ventilating equipment, with plants at Detroit and Cincinnati. Its Canadian business is handled by the Canadian Sirocco Co., Ltd., with plant at Windsor, Ont.

The American Radiator Co. also plans to put a new plant in operation at Gloucester, N. J., in a factory building acquired some time ago from the Pusey & Jones Co., Wilmington, Del. The plant was built during the war and has not been operated since. A short time ago the Radiator company purchased the Kewanee Boiler Co., Kewanee, Ill., and a few months previously the Hummer Engine Works, Springfield, Ill.

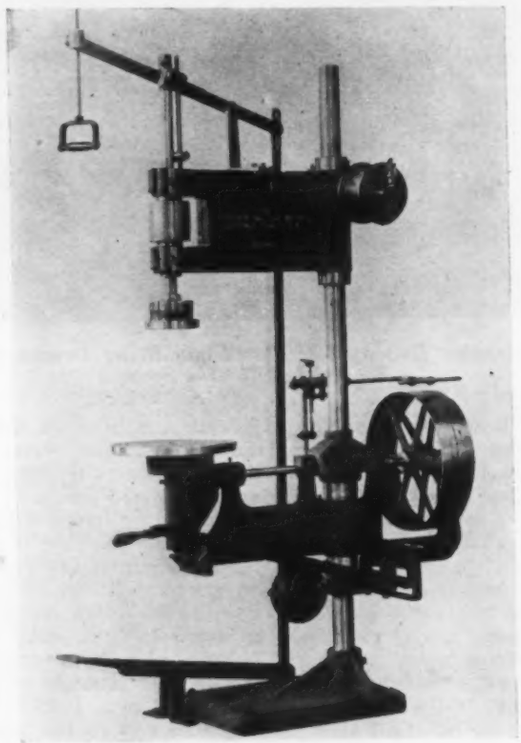
The Burden Iron Co., Troy, N. Y., has removed its Boston office from 141 Milk Street to 1425 Statler Building, Arlington Street at Park Square. Charles S. Clark is district sales manager.

The Bureau of Standards has issued circular No. 140 regarding Federal Specifications Board specification No. 52a for wood screws.

Flexible Belt Polishing Machine

Designed for polishing and finishing metal or wood parts, a motor-driven flexible belt-type polishing machine has been brought out by the Defiance Machine Works, Defiance, Ohio. This machine is intended especially for finishing the curved surfaces of irregular shaped metal parts and for finishing various wood parts such as automobile steering wheel rims, toilet seats, mirror frames, etc. The machine is usually furnished with pulleys which accommodate polishing belts 2 in. wide, although it can be arranged to carry wider belts. The belt is 148 in. long, affording a liberal amount of polishing surface. It is stated that the machine is well adapted for use in polishing metal by using emery belts.

The frame, of the pedestal type, is a substantial casting with cored center and a broad floor space, to insure proper support of the working parts and to prevent vibration. An adjustable arm, supporting the two idler pulleys over which the polishing belt travels, can be set in any desired position to suit the convenience of the operator and the character of the work. A V-shaped yoke supporting the idler pulleys is fitted to a ground steel spindle 1⅛ in. in diameter by 24 in. long. The spindle slides through a substantial bearing and is controlled by coiled steel springs located on each side of the arm. These springs are attached to an adjustable collar fitted to the spindle, for obtaining the proper amount of flexibility and imparting tension to the polishing belt.



Flexibility Is a Feature of This Polishing Machine

The idler pulleys, 3¼ in. in diameter by 2½ in. face, are supplied with self-oiling devices constructed to prevent the admission of dust or dirt into the bearings and to prevent heating. They are located at a convenient distance apart to allow the work to be held at any angle so that the polishing belt can reach all the furnaces to be finished. As all running parts are balanced to eliminate vibration, this allows the belt to be run at a speed of 5000 ft. a minute. This feature, it is said, gives the maximum cutting efficiency obtainable. The machine is driven by a 2-hp., 1800 r.p.m. motor.

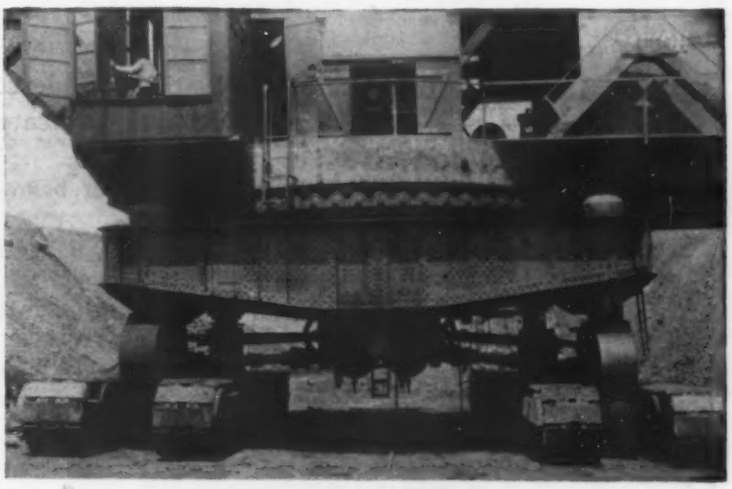
The Harvard Engineering School, Cambridge, Mass. is broadening its field by including industrial sanitation. Prof. G. M. Fair will be in charge.

Largest Electric Stripping Shovel Carries 12 Cu. Yd. Dipper

The Northern Illinois Coal Corporation of Chicago will soon put in operation on its property near Verona, Ill., what is said to be the largest electric stripping shovel ever built.

This shovel, built by the Marion Steam Shovel Co., Marion, Ohio, is to be mounted on crawling traction trucks equipped with Marion hydraulic equalizing jacks which automatically hold the machine level while traveling or working on rough or uneven ground. It carries a 90-ft. boom, 60-ft. dipper handle and 12 cu. yd. dipper and will strip overburden up to approximately 50 ft. in depth. Although much heavier throughout, the design of this large shovel, designated as the type No. 5480, follows that of the company's No. 350, which is intended for use in the coal stripping and ore mining fields. The range of the machine is approximately the same as that of the type 350, except for the increased dipper capacity, which is intended to permit 50 per cent more production than heretofore.

The electrical equipment is of the General Electric Co. design, and consists of two 255-hp. motors on the hoist, two 75-hp. motors on the swing and one 150-hp. motor on the crawl, all motors being rated on a 60 min. basis. The motor generator set which furnishes the power to the individual motors has a continuous rating of 700 kva.



Stripping Shovel with 12-Cu. Yd. Dipper

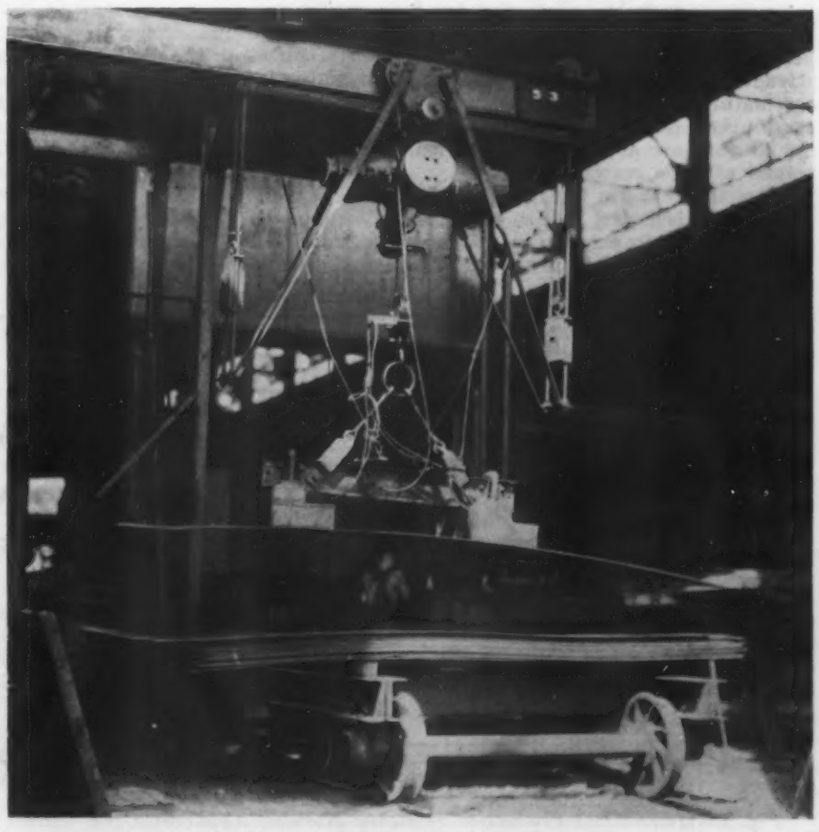
Handling Steel Plates by Magnets, Without Swinging

Troublesome swinging of a load carried by electric magnets has been avoided by a device developed by the Union Metal Products Co., Hammond, Ind., manufacturer of pressed steel car ends and similar products using steel plate.

Two rectangular lifting magnets (Electric Controller & Mfg. Co., Cleveland) are hung from a spreader beam which is itself suspended by a cable from a monorail hoist. The plates handled by this equipment are charged into a heating furnace one at a time by an operator in a control room opposite the end of the furnace. No floor man is used to steady the plates as they are being carried to the charging platform, so a mechanical means of assisting the operator was devised.

Two arms were extended out from the monorail hoist parallel to the track and, from the two ends, vertical slides were hung and rigidly braced. On each slide a counterweight was suspended from a cable which runs up over a pulley and down at an angle to the spreader beam supporting the magnets. The counterweights are small, but this rigging is sufficient to hold the magnets in line and to stop all swinging of a lift after the one or two initial swings.

In any case, such swinging as does occur is held to such a narrow arc that its results are negligible. This has released for other duties the men usually required to steady the plates and thus has lowered the handling cost.



Limiting Guides, Hanging from the Hoist Carriage, Prevent Troublesome Swinging of the Load

Inclosed Motors for Portable Hoists

A new line of motors for portable electric hoists, and suitable also for other applications involving intermittent operation and high starting torque, is being put out by the General Electric Co. The line runs from 1 to 10 hp. in the direct-current types; from 1 to 11 hp., single speed, 3 and 2-phase, and from 1 to 5 hp., single-phase, in the alternating-current types. Three and two-phase, slip-ring type hoist motors are included, from 3 hp. up.

These new motors are totally inclosed and all parts are protected. Bearings are of the waste-packed, sleeve type, being closed against the entrance of dirt from the outside. The d.c. motors are series wound. The a.c. motors of the polyphase type have high-resistance rotors, while the single-phase motors have an unusually high starting torque.

In a great many of the applications of these motors a brake is required. Accordingly the motors are all built with the shaft extension (away from the drive) to take a brake.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Current Statistical Data, Considered Independently of Trade Opinion, Indicate That:

Steel ingot output has dropped further below normal, and may have reached the bottom of the movement.

Unfilled orders have begun to increase, indicating, on the basis of past history, that prices may shortly rise.

While the pig iron index has fallen below normal, it still is large in comparison with ingot output and price recovery does not seem imminent.

Commodity prices have had a slow upward movement, which may carry finished steel prices along to a proper relation with their raw materials.

PERHAPS the most notable point in the iron and steel situation is the fact that there has been so little change in prices in spite of the great dullness of demand. One is forced to conclude that prices must be close indeed to bottom levels. If excess supplies existed, and were being pressed upon the market, prices would inevitably decline. Probably, too, if consumers were generally convinced that much further decline is to be expected, they would hardly buy even as much as they have been doing recently.

This idea is merely emphasized by the existence of particular price weaknesses, such as are to be found in the markets for wire rods and nails, sheets and steel scrap. In these cases more or less weakness should exist, for the demand for the products mentioned is clearly less than the supply. Residential building operations are at a low ebb, which affects the demand for nails. Automobile production has been greatly curtailed, so that the demand for sheets has declined. The general curtailment in steel making, which tends to strengthen the markets for finished steel on the average, naturally means reduced demand for scrap. Even scrap prices, however, appear to be quite irregular and clear signs have appeared that the market is reaching bottom at some centers.

How then explain the fact that the average quotations on finished steel hold so steadily, and explain the recent firmness in pig iron in some markets, unless on the ground that supply is so well adjusted to demand that, in spite of the smallness of the demand, the market is in a position to be maintained?

Steel Production May Be at Bottom

IN October, steel production fell further below normal than it has been in any month since August, 1924. Considering the season, it was also the lowest in comparison with the level of unfilled steel orders since April, 1925. The cyclical decline since August, 1926, is now plainly apparent. According to our computation, the October ingot output was only 87 per cent of normal. Production for the month was only 8 per cent below the normal line, but fell so far short of the usual seasonal increase over September that the seasonally adjusted figure was 13 per cent below normal. How near to the minimum has production fallen? Will it go as low as in 1924?

Several considerations lead to the conclusion that the decline in production will not be carried much further and will not reach so low a point as in 1924. The unfilled orders of the Steel Corporation have already shown a rising tendency, which was not true at the bottom of the earlier cycle. Steel prices are much lower than in 1924 and are closer to cost of production. Commodity prices in general average higher than then and have risen considerably. Finally, the P-V line barometer, which usually anticipates the movement of steel production, has been rising for several months.

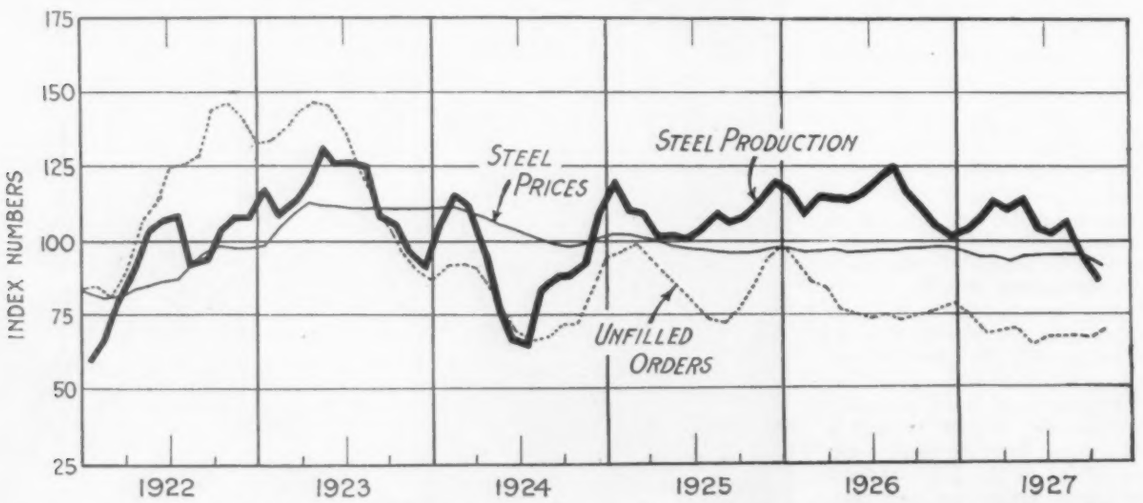


Fig. 1—While Steel Production Is Below Normal, Apparently the Bottom Is Just Ahead. Prices, while slowly sagging, have changed only slightly for months. As unfilled orders have started rising, it is believed that prices will follow

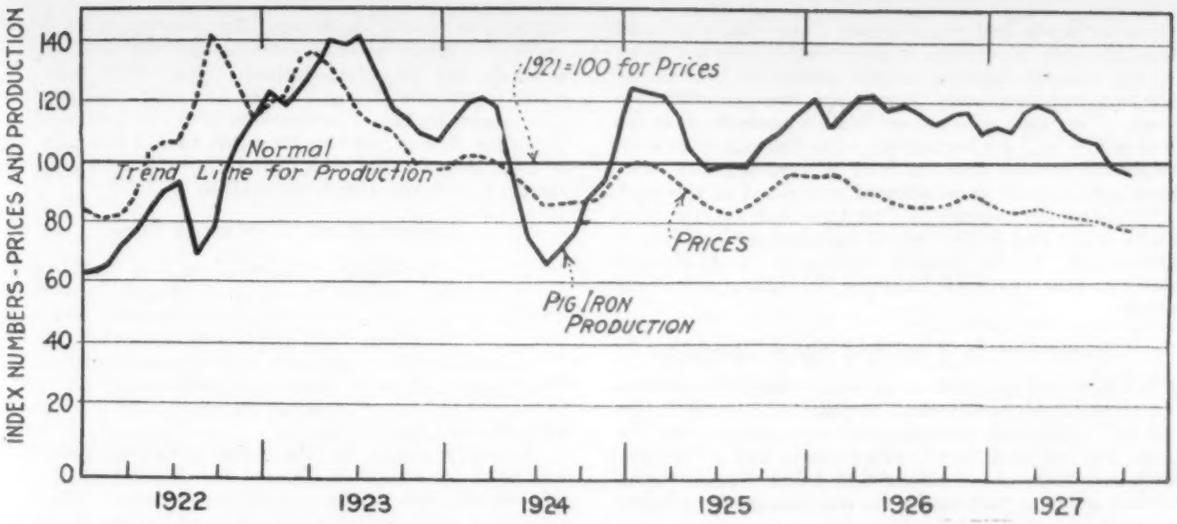


Fig. 2—Reduced Output and Low Prices of Pig Iron May Give Way to Irregularity in Both Elements. No recovery in the pig iron market is anticipated before the end of the year

Unfilled orders of the United States Steel Corporation last month increased more than usual for the season. In October they were 68.6 per cent of the average for the years 1921-1926, which compares with 64.6 per cent in September. This gain is emphasized by the fact that, while there is usually a seasonal increase in October of about 1 per cent, the actual increase last month was about 3 per cent. Accordingly, our adjusted index is 70 per cent of the six-year average, and, considering the season, is the highest since last April.

The increase in the unfilled orders is not so significant as if production had not been curtailed. Moreover, the figure is the lowest, for the season, that has existed in any recent year. In forecasting, however, it is the *trend* that counts. We consider that unfilled orders have definitely passed the low point of the cycle. Although any large increase seems improbable, slight upward trend indicates the near approach of a period when steel production may again expand.

THE IRON AGE composite of finished steel prices decreased in October, being 2.314 cents, against 2.357 cents in September and 2.449 cents a year ago. At this writing the index is 2.293 cents, but it has held at that level for four weeks in succession. Rarely do we find declining steel prices when unfilled orders are rising, and this is especially true when production is below normal. Accordingly, there seems to be a reasonable probability that a moderate recovery in the average of steel prices is not distant—perhaps not more distant than the latter part of December.

Irregularity in Pig Iron

PIG iron production is definitely below normal, and more so than in any month since November, 1926. The October production was 1.3 per cent under the line of normal trend, and, when allowance is made for the failure to show the usual seasonal increase, the adjusted production figure is only 96.5 per cent of normal. This compares with 99.2 in September and 116.5 a year ago. It is notable that the pig iron output has not been curtailed quite so sharply or so much as has steel production and, therefore, it is still rather high in comparison with steel makers' requirements. In view of the low price of steel, there is sufficient excess of pig iron production to prevent any general recovery in prices before the end of the year. Further irregularity and local weaknesses are probable.

The situation, however, is being corrected. In October the ratio of the average daily production of pig iron to the average daily production of steel ingots decreased considerably. Stocks of merchant pig iron are believed to have increased at a less rapid rate since July and the accumulation of stocks is not so great as it was in 1924. Production is not only below normal, but it is down to the point at which, in August, 1925,

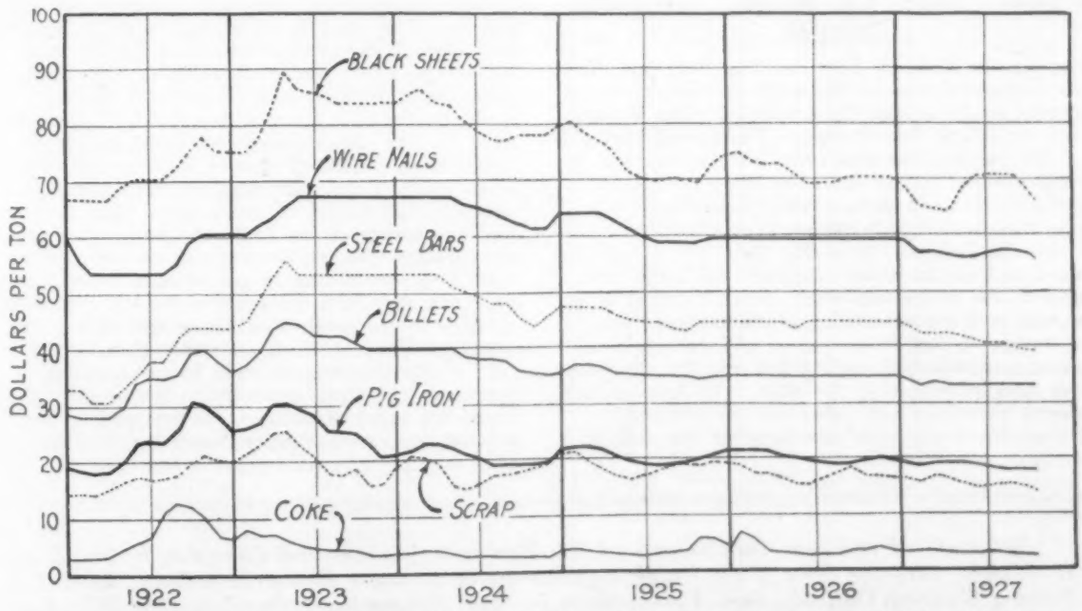


Fig. 3—Finished Steel Prices (in Particular, Sheets and Bars) Continue Low with Regard to Semi-Finished and Raw Materials. Readjustment of the price structure awaits improvement in demand, notably from the automotive works

recovery in pig iron prices began. And it may be noted that the rate of decline in the monthly average price of pig iron has tapered off, the decline in October being at a less rapid rate than in the other months since June. For these reasons we think it probable that pig iron prices will see bottom levels in November, and believe that greater firmness is to be expected soon, with good prospects of some advance at the end of the year.

The October average of THE IRON AGE pig iron composite price was $17.88, which compares with $18.03 in September. At the present writing it is $17.63, and shows a slight advance from the low point, which was $17.54.

Dislocation in Finished Steel Markets

COKE prices are now at a point where the curtailment of production may be expected to sustain the market. Coal and coke markets are easy, to say the least, but are plainly so near bottom that a little industrial expansion would quickly bring recovery. As already noted, a turn in the pig iron market is probably not distant.

In spite of the current weakness of the scrap markets in most localities, various indications favor a not distant recovery. It is true that scrap has been cheaper than it now is. It could go lower. In some markets it is still declining. But reports from other markets indicate greater firmness and the situation as a whole can be called "mixed." The chief point in favor of greater strength is the fact that steel production is now higher in comparison with pig iron production than it was. Before long this should mean an increased demand for scrap, and any strengthening in steel prices would clinch the matter.

Finished Items Too Low in Price

The raw materials, coke, pig iron and steel scrap, are in normal relation to one another and at present level they furnish a bed-rock basis for the iron and steel price structure. All other items are either cheap or reasonable in comparison with the raw materials, black sheets and steel bars being particularly low. Billets certainly are reasonable in price when compared with the raw materials.

A readjustment in the price structure of steel awaits improvement in demand for finished steel, notably in the case of the automobile industry. The expansion in the production of cars and trucks, which is to be expected not later than the early part of next year, should bring a stiffening in the markets for sheets and bars, and that, in turn, will tend to raise the whole structure.

Production of Steel Castings at Lowest Point in Two Years

WASHINGTON, Nov. 22.—Orders for commercial steel castings in October totaled 48,762 net tons, or 37 per cent of shop capacity, against 50,630 tons, or 38 per cent of capacity, in September, according to the Department of Commerce. They made the smallest total in more than two years. Production in October totaled 58,694 tons, or 44 per cent of capacity, compared with 67,077 tons, or 50 per cent of capacity, in September, and was the smallest in more than two years.

Of the October orders, 14,029 tons was for railroad specialties, representing 23 per cent of this class of capacity; while bookings for miscellaneous castings amounted to 34,733 tons, or 48 per cent of capacity.

Bookings for the 10 months ended with October aggregated 738,670 tons, or 56 per cent of capacity, against 838,774 tons, or 63 per cent of capacity, for the corresponding period of 1926. Production for the 10 months ended with October was 806,637 tons, compared with 926,204 tons for the corresponding period of last year.

Carpenter Steel Co. Makes Important Changes

The Carpenter Steel Co., Reading, Pa., has completely remodeled one of its buildings which is now being used as offices for the executive, sales, accounting and operating departments. The remodeling and use of this building has made possible the complete remodeling of the former office building for use as a modern chemical and metallurgical laboratory.

A new 10-in. bar mill has been installed in connection with the 7-stand 9-in. mill. This mill is now in operation and on the same unit there are some extensive alterations under way which include, among other things, the complete rebuilding of the heating furnaces and a change of fuel from coal to oil; the erection of a modern merchant mill cooling bed and the extension of floor area surrounding the mill; a modern reeling equipment, repeaters and other related equipment.

During the year, work of changing the coal-fired annealing furnaces to oil was completed and they are now in regular operation. Alterations to buildings are also under way which will permit the centering of the engineering and mechanical work in one building.

High Production of By-Product Coke

Output of by-product coke in October totaled 3,713,000 net tons, an increase of 111,000 tons, or 3.1 per cent, when compared with the September production, says the Bureau of Mines. This total has been exceeded but twice during 1927, in March and May, and with the exception of October, 1926, is the highest yet recorded for October. The production of beehive coke continued to decline during October, the total being estimated at 419,000 tons, a decrease of 38,000 tons, or 8.3 per cent, when compared with September.

Sees Great Future for Aviation in United States

Luxurious airplanes traveling on schedule over charted and illumined air routes—"taxi" airplanes awaiting the call of the busy business man—private pleasure planes of such safe construction that the danger of accident is no greater than in an automobile—such is the picture envisioned for the near future by Clarence M. Young, director of aeronautics, Department of Commerce, in his annual report.

If, as has been charged, the United States was laggard in its development of civil aeronautics, Mr. Young's report shows that it is going ahead at good speed now. Last year airplane construction in this country was valued at more than $20,000,000—a 60 per cent increase over 1925. Airplanes of new design are rapidly replacing the war surplus types which have been doing service up to the present. New air routes are being charted in all parts of the country; cities are vying with one another in the construction of the most improved airports. It is estimated that by the end of 1928 a thousand airports will be in operation, a large percentage of them municipal. Numerous cities and towns are being airmarked, one company alone having painted city names on more than 4000 of its stations.

Schedule of the next installments of the ***Business Analysis and Forecast****, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows:* ***Dec. 1****—General Business Outlook;* ***Dec. 15****—Activity in Steel Consuming Industries;* ***Dec. 22****—Position of Iron and Steel Producers.*

Government Work in Developing Mineral Resources

WASHINGTON, Nov. 22.—In the field of metallurgy, the Bureau of Mines is continuing its efforts to conserve the Nation's mineral resources through the development and improvement of methods for recovering more of the mineral content of ores and lessening the cost of recovery, says Director Scott Turner in his annual report. The bureau is giving attention to the utilization of the low-grade manganiferous iron ores in northern Minnesota in the hope of increasing the Nation's production of manganese. Work is continuing in methods of utilizing the large reserves of low-grade, complex ores in the Western States and on the development of the flotation process, which has greatly increased the mineral wealth of the country. A method of agglomerating slime and fine particles in leaching ores, discovered by the bureau's engineers, is believed to hold promise of wide application to copper and other ores.

The development of a small iron and steel industry in certain western localities is suggested by experiments on the production of sponge iron at the Northwest experiment station, Seattle. Sponge iron also promises to be increasingly important in the hydrometallurgy of low-grade copper and complex lead ores, the report says.

"Studies for the development of acid extraction processes, leading to cheaper methods for obtaining aluminum metal from clays and other aluminum silicates abundant in nature," the report goes on, "have been completed. Many power sites in the western intermountain region could produce aluminum cheaply if a satisfactory source of aluminum oxide were available."

Steel Barrel Shipments Eating Into Unfilled Orders

Shipments of steel barrels in October are reported by the Department of Commerce at 572,893, an increase of nearly 10 per cent from the 525,374 of September. The enlarged shipments have resulted in decreasing the unfilled orders from a total of 1,124,439 on Sept. 30 to 1,000,559 on Oct. 31. About 21 per cent in each case called for delivery within 30 days. Production during October was 578,408, against 521,899 in September. Only four months of the preceding 14 showed higher production and shipments than in October, these being last August, June, May and April.

Shipments of the members of the Steel Barrel Manufacturers Association in October were 345,782, while unfilled orders at the end of the month amounted to 507,817. The volume of business for the month is reported at $1,115,298. Capacity was engaged to the extent of 35.7 per cent for I.C.C. barrels, and 50.9 per cent for light barrels, an average of 47.6 per cent.

National Tube Co. Transferring Riverside Works Employees

Signs multiply that the National Tube Co. intends to abandon its Riverside works, Benwood, W. Va., at which no pipe has been made for more than two years and, except for some experimental work last year on a welding process, has been idle since the early part of 1926. Lately the company has been placing the salaried employees of the plant at other plants, with an idea of saving the maintenance charges, which have been going on since the suspension. In the manufacture of pipe it is regarded as a high cost plant and its usefulness really ceased when the company started its new Gary mills early in 1926.

The by-product coke plant some time ago reverted to the Semet-Solvay Co., which has been operating it in the production of domestic coke. Much money was spent in 1925 in modernizing one of the two blast furnaces at the plant and it is understood that the Wheeling Steel Corporation, has been negotiating for the purchase of that furnace with an idea of supplying hot metal to its Benwood pipe plant.

Another Steel Corporation Wheeling district steel works that has made its last steel is the Carnegie Steel Co. works at Bellaire, Ohio, across the Ohio River from Wheeling. It also has been idle for about two years and no money has been spent in bringing it up to present-day standards of production practice.

Productivity as Affected by Accident Rate

Surveys made by 46 local committees working under the American Engineering Council have shown something of the relation between the accident rate in industry and the productivity. Figures announced by Dean Dexter S. Kimball, of Cornell University, president of the council, were built up from data covering 13,898 industrial companies, 122,028 company-years, 2,454,413 employees, 13,143,569 man-years, and 54,430,707,000 man-hours. Some of the findings follow:

Maximum productivity depends upon the reduction of accidents to an irreducible minimum. There is such a close relationship between safety and production that it is impossible for a plant to have continued increases in productivity unless it reduces, at the same time, its accident rates.

Experiences of individual companies show that material reductions in accident rates can be obtained simultaneously with increases in production rates.

The rate of production per man-hour, for the industrial groups studied, was 14.4 per cent higher in 1925 than in 1922.

The rate of accident frequency per man-hour was 10.4 per cent lower in 1925 than in 1922.

The rate of accident severity per man-hour was 2.5 per cent higher in 1925 than in 1922.

The accident and production performance of the best plants clearly shows that great improvements can be achieved by the remaining plants in each industry.

The incidental or accompanying cost of industrial accidents is a larger loss than is realized in the operation of industry.

Minor accidents are accountable for a much larger loss of productive time and value than is generally recognized.

Organized safety work, which is effective in reducing the frequency and severity of accidents, is being carried on in only a relatively small percentage of industrial plants.

Railroads and Motor Trucks

Improvement in the daily average movement of freight cars is credited by the National Automobile Chamber of Commerce to the use of motor trucks for short hauls—up to 30 miles or so. It is said that much of the delay in the operation of freight on the railroads was occasioned by short hauls, with disproportionate use of terminal or other station facilities. Congestion from this source is charged with much of the erstwhile delay to the longer-run movements.

Some of the improvements which have been brought about in the past few years are pointed out as including a gain in freight car movement from 24 miles a day under Government operation to 30.9 miles average for the first eight months of 1927. Shortages of cars in the heavy crop moving season have been avoided almost wholly, in spite of the fact that the railroads have purchased relatively few cars in the past few years.

Operation of the motor truck over long distances is said to be uneconomical. Its special advantage of flexibility with regard to routes and terminal points disappears increasingly as distance increases. Over the short distances, however, in which the railroads have found small profit, the motor truck appears to have found its logical use.

Biddle & Smart Co., Amesbury, Mass., maker of automobile coach bodies, is preparing for a new run of bodies, to start in December. During the past summer the company established a new heavy press department for sheet metal stampings. A system of power conveyors also has been installed.

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This Issue in Brief

Buyer refuses to accept price cut. He reasons that if he takes it, his competitors will likewise receive it, probably reducing their prices. Thus a price war might be brought about, demoralizing the industry.—Page 1436.

"Starving" your sand blast equipment is false economy. Compressed air is cheaper than labor, and if more air will shorten the cleaning time, you can cut your costs by increasing the air supply.—Page 1435.

Saves money by shutting down northern closed shop and buying from southern open shop. Wide difference in production costs throughout stove industry is due to union influence. To protect its agreements with northern manufacturers, the union is trying desperately to unionize the southern plants.—Page 1442.

Acetylene is as cheap or cheaper than city gas for operating cutting torch, says acetylene manufacturer. Thirty per cent more oxygen is required with city gas, he declares. Further, on rusty material it is not possible to maintain a steady cutting rate with city gas.—Page 1446.

Foresees a new era of prosperity for the gray iron foundry industry. Pearlitic iron will regain for the gray iron foundry much of its lost business, says foundry engineer. Without sacrificing rigidity or low cost, this iron will withstand torsion and fatigue strain and stresses, equivalent to malleable and in some cases equal to steel, he declares.—Page 1448.

By rolling a bundle of rods, with a sand core center, a drill-less hollow staybolt bar is produced. A pipe full of sand is made the center of a fagot of steel or iron rods, which is heated to welding temperature and rolled. The sand is then blown out. The process is said to represent a definite economy compared with drilling.—Page 1451.

Pig iron prices will see bottom levels in November, Dr. Haney believes. Greater firmness is to be expected soon, with good prospects of some advance at the end of the year, he predicts.—Page 1460.

"Nervous" slicing of expenses is no way to cure a sick business. The trouble must be carefully diagnosed, and treated scientifically and methodically. It may be that the industry is ailing and must be cured before the individual business can regain its health.—Page 1438.

Can not solve the mystery of transverse fissures in rails, but electrical device will detect fissures. Interstate Commerce Commission declares that this fault can not be traced to manufacturing conditions. Sperry's electrical resistance device will locate fissures as small as 2 per cent of the area of the rail head.—Page 1435.

Are sales managers responsible for declining profits? In many cases they are, says Saunders Norvell's friend. He charges them with being interested only in sales record, and with authorizing price cuts without due thought of what the result will be.—Page 1437.

Casting losses cut 50 per cent by increasing the pouring temperature of the iron. By installing cupola pyrometers a Philadelphia foundry has been able to regulate closely the temperature of the molten metal as it comes out of the cupola. Jumping the temperature from 100 to 200 deg. cut the daily casting loss exactly in half.—Page 1448.

Production efficiency and low accident rate go hand in hand, Engineering Council finds, ". . . it is impossible for a plant to have continued increases in productivity unless it reduces, at the same time, its accident rates." The survey reveals that accident frequency in industry has decreased while the rate of production has increased.—Page 1461.

Why foundries lose money. The acceptance of no-profit or below-cost business, to attain volume, is the chief reason. Other reasons are: Allowing freight to customer's plant; giving cash discounts; allowances on returned castings; incorrect figuring of melting labor costs; quoting average price per lb., and not figuring costs of cored castings correctly.—Page 1444.

Even experienced welders tend to become lax, unless given periodic tests, says insurance company executive. He declares that welders will do first-class work after a period of training, but many lapse into a period of indifference, or develop unsatisfactory methods of their own. Regular tests for the experienced men, as well as the beginners are recommended.—Page 1446.

Red ink on balance sheet is eradicated by drastic reduction in types of product. Small tool manufacturer found that 400 of the 55,000 kinds of cutters he made represented 72 per cent of his total sales. Concentrating on big sellers put the business on a paying basis. Going a step further, tolerances were increased from thousandths to ten-thousandths, stimulating sales and introducing greater manufacturing efficiency.—Page 1440.

To cut the cost of cleaning castings, forgings, etc., study the handling and transportation of the material. Many plants waste money through failure to link up the cleaning room properly in the production chain.—Page 1433.

Hard buying methods must cease. "The policy dictated by the executives of the General Motors Corporation to its buying departments . . . advises them that they must cease their hard buying methods and be willing to pay a price that is fair to the manufacturer as well as to themselves . . .," says head of manufacturers' association.—Page 1491.

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672 Brands of Tool Steel

THE path beaten to the door of that fabled mousetrap maker who lived in the deep piney woods was made by steel salesmen trying to sell him springs.

He was like the present-day manufacturer near the Canadian border of Vermont who received calls from seven steel salesmen in two weeks last summer. They weren't on vacations, either. Each one of them used at least 24 hours' time and corresponding travel expense in an effort to get a contract for his steel requirements. This manufacturer buys about one carload of steel every six months, and each of the salesmen knew that fact.

No matter who got that business, no profit was made by the industry. It would have been better by far if the Vermont man had been left in peace to re-order from his former source. He did anyway.

This wasteful duplication of effort is on the same order as that permeating the entire tool steel industry. A survey of the brands now on sale in the United States shows that no less than sixty-one firms are marketing 672 tool steels. Multiply each brand by the various sizes and shapes manufactured or stocked, and the maze increases. Clearly the number is far beyond any real need, even for the diverse demands of cutlery, tools, hardware, punches, dies, chisels, broaches, taps and drills for whatever purpose. Here is the distribution as shown by the survey of the American Society for Steel Treating:

	American Melters	American Brokers	Foreign Representatives
Number of firms	29	21	11
Number of carbon tool steels	97	57	50
Number of alloy tool steels	198	59	61
Number of high-speed steels	55	20	22
Number of non-deforming steels	28	14	11
Total	378	150	144

Criticism has been leveled at the tool steel salesman because he knows too little about his offerings apart from sizes, price and delivery. Granted that his average metallurgical information isn't very wide, who wouldn't be hard put to convince a doubting customer that "XYZ special crucible drill rod" which your firm makes is better for his use than the "ZYX superior crucible drill rod" sold by a competitor, when a mixed lot couldn't be sorted by the makers themselves? About the only argument that would count much is price, and when any industry starts selling on that basis lean years are just around the corner.

Coal Mining Economics

IN respect to the economics of bituminous coal production in the great Pittsburgh district two representations appearing substantially contemporaneously in the daily papers were unusually illuminating.

1. From the *Wall Street Journal*, Nov. 15, 1927:

> Pittsburgh Coal Co. has gone through four unprofitable years but during that time practically every phase of its activities has been revolutionized. With its labor problem solved, plants modernized, production and sales methods changed, it is in a position to demonstrate its true earning power soon.
>
> Since resuming production in Ohio on an open shop basis in May, 1925, and in Pennsylvania in August, 1925, production has been expanded steadily until the company is mining now at the rate of 10,000,000 tons annually, having definitely defeated the United Mine Workers of America. Resistance to recruiting of miners practically is at an end and an adequate supply of labor is now available.

2. From the New York *Herald Tribune*, Nov. 16, 1927:

> The American Federation of Labor voted yesterday to lay before President Coolidge the cause of 130,000 striking miners in central and western Pennsylvania and Ohio and to demand from Governor John S. Fisher an immediate investigation into charges of misuse of power by agencies of the State Government against 85,000 mine workers in the two Pennsylvania districts. The report pictured 85,000 striking miners of central and western Pennsylvania and their 325,000 dependents as on the verge of bitter destitution.

It is unnecessary to offer much in comment upon this situation. In the Pennsylvania-Ohio

districts the superfluity of 130,000 miners in an overmanned industry has been definitely crystallized out. Those miners, manifestly the more intelligent, who have freed themselves from the misdirection of union leaders are obviously doing better for themselves at reduced wages than are those who are not working at all. In this juncture the best thought of the union leaders is to restore a condition of shackled courts and police, permitting terrorism so that nobody may work full time, and the greatest and most enterprising corporation can make no money by virtue of the requirement that it and its competitors must support a large number of unnecessary men.

This reflects a paucity of thought that is practically inanity. The fate of the exuded miners is indeed pitiful and excites compassionate emotions. Yet it is clear that in the end it will be better for them to be driven to other occupations than to be allowed to linger in fields where they are not needed. Why should not this be recognized by the American Federation of Labor, which might exhibit itself as the true friend of labor by advising, promoting and facilitating migration in this instance? Perhaps it does not venture to think in such terms out of fear of directing a flood of jobseekers against its own strongholds and eventually tumbling down all of its walls.

Steel and Other Earnings

AN editorial in THE IRON AGE of a fortnight ago called attention to the fact that the relation of net to gross earnings of public utilities had increased continuously since 1920, constituting a plain inference that the public approves of capital having decent earnings. We accordingly suggested that steel, being very useful although not technically a "utility," should be permitted to earn fair returns upon the capital, and concluded with the words: "A principle is involved and the question may properly be raised whether manufacturers should not have means for securing fair payment for the services they render."

The editor of the New York *Annalist*, who has been seeing black for many months, in looking out upon American business, was referring to the small earnings of steel companies lately and thereupon remarked: "The depression has, in fact, given rise to bad dreams," citing as an evidence this IRON AGE editorial. The *Annalist* denies that the "principle" involved is the one we suggested and substitutes "the principle of not creating an excessive overhead load which makes the industry incapable of earning satisfactory profits in times of moderate business activity." It suggests "liquidation of excessive producing capacity and devising more efficient methods of carrying on the business."

To this contention anyone familiar with the history of the steel industry and the present circumstances can readily supply an adequate rejoinder. Liquidation of the unfit in an industry is simple when there is enough unfit; but the trouble with steel, viewed from this angle, is that it is too efficient. The percentage of the distinctly less efficient is so small that its elimination would make scarcely any difference. And when more efficient methods are devised, as is being done constantly, substantially the whole industry participates.

It is not true, however, that for the best interests of trade at large the steel industry is oversized. To reduce it to a level at which scarcity of steel at intervals would mark prices sharply up would be disadvantageous to the consuming public. Steel prices used to advance on some such basis. After a great rise they would hold for a considerable time because there were contracts with nearly all buyers, virtually guaranteed against decline and deterring producers from cutting. When prices declined another rush of buying eventually occurred, sending them up again. The system arose from the circumstances and was not beneficial to buyers. Now the circumstances are different, demand being steady. It would be unfortunate for consumers were capacity to be so restricted that in the course of time a scarcity would arise.

It is of great service to the public that there should be always an adequate supply of steel. The service is a sort of private utility, as THE IRON AGE suggested, in view of the almost universal employment of steel, and the industry is entitled to a fair return upon its investment. The public may well recognize the right of steel as it has been recognizing the right of the public utilities. This is not a contention that the public should fix the price of steel.

The attitude of a part of the public, a small but vociferous part, has long been that by hook or crook the steel producers should be forced to compete with each other, even destructively. The attacks on the Steel Corporation in the dissolution suit, the attack on Pittsburgh Plus and the attack on the Bethlehem merger are examples. A reasonable amount of non-interference is the desideratum, and that falls far short of active government assistance.

The difficulty in steel is not an excess of capacity, but the fact that it is a standardized staple, with year by year a higher proportion of capital cost to the labor and other "out of pocket cost.

Instalment Buying

WE did not participate in a noteworthy dinner party on Nov. 17 but as we studied the manifestly careful, apparently authorized, accounts in the newspapers of the next morning, the idea formed itself in our minds that the bright star was not Seligman, the eminent economist in whose honor the dinner was given, but rather Raskob, the financier who gave it.

As this idea was crystallizing we were dazed in admiration of the imperial gestures of the General Motors Corporation. There had been criticism of its policy of promoting instalment selling. Itself desired to know if there were any merit in the criticisms and, if it were really jeopardizing the national economy, was prepared to abolish it: Consequently, the retaining of Professor Seligman to study the subject; his employment of a staff of fifteen or twenty assistants during fifteen months to assist him; a report, i.e., a treatise, in two big volumes; a dinner party at the Ritz-Carlton, New York, by Mr. Raskob, as chairman of the corporation's finance committee, to Professor Seligman and

500 leaders in industry as guests; and an address by Professor Seligman summarizing his findings. This truly was a Napoleonic conception and its consummation was a national event.

It is furthest from our thoughts to belittle its significance. As any agent for national advertising will bear witness, it is more important to produce an impression upon the public mind than it is to deliver the goods. There will be no doubt that, following the Raskob-Seligman dinner, the American people will be easy in their minds in respect to there being no economic danger in widespread instalment buying, and anyone who offers opinions to the contrary will henceforth receive no general attention.

There is not the least irony in these remarks, for we have heretofore deprecated Cassandran warnings in respect to this practice. Professor Seligman in fact confirms much of what we have urged. We hesitate to be critical of him in the absence of reading his full report. He referred to the difficulty of summarizing it in an evening's address. We are even bolder in representing its pith in the simple expression that consumers' credit is economically as sound and practically less subject to becoming frozen than is producers' credit. In short there is nothing inherent in instalment buying to lead us straightaway to economic disaster, or ever to do so.

This does not, however, nor did Professor Seligman, refer to the evils that we have previously pointed out, viz., that people are tempted to buy things that they would otherwise do without, and that they have to accede to stiff terms for accommodation in yielding to the temptation; and the economic danger that, in a period of widespread unemployment, credits might not become merely frozen but might always stay that way.

We are unable to agree with either Professor Seligman or Mr. Roskob that instalment buying is a stimulant of production, i.e., of increase in the national income, or at least that ipso facto it is so. If this were true, we should make haste to arrange all of our affairs on such a basis. We are sure that many of our fellow citizens will prefer to pay as they go.

Mr. Raskob was most interesting in his information that in 1926 the retail value of the production of automobiles and parts was about six billion dollars, while the cost of building garages and highways was four billion, a total of ten billion (which must be about one-eighth of the total national income). The automotive industry itself furnished employment to 3,300,000 persons.

If 3,300,000 workers had been released from other duty in the national economy by virtue of improved mechanization, management, etc., and if instalment buying had been the stimulus in providing occupation in the supply of a new thing, there would be something to say for it as an agency contributing to increased production. If, on the other hand, it had merely led to a diversion and capture of labor and material, not so. There are economists who argue each way, and probably the truth is somewhere between them. Professor Seligman in his summary did not advert to this fundamental thought.

We are kindly toward Mr. Raskob's enthusiasm for the young and gigantic industry wherein he has now taken place beside Henry Ford as a great personal symbol. Whether it has given us a luxury, a semi-luxury, or a necessity, it has produced a radical change in our national life. We are not quite convinced that its promotion by instalment buying has been an economic blessing. Nevertheless we agree that it has not in itself introduced an economic mischief.

Changes in Wholesale Price Basis

ANNOUNCEMENT was made some time ago by the United States Bureau of Labor Statistics of a new basis in calculating prices of commodities. In place of the time-honored 1913, the new base year is 1926. In place of 404 commodities, the new group comprises 550. In place of the nine major groups into which the total list formerly was divided there now are ten. This results from splitting up the former cloth and clothing group into textile products, and hide and leather products.

While undoubtedly much advantage may result from the new alinement, there is at the same time a good deal of covering up of the changes which have taken place during the years since the war. By taking 1926 as a base, the bureau has adopted, and, in a certain sense, taken as reasonable, the price relationship which existed during that year and which was markedly different from that prevailing in 1913. For instance, building materials and clothing materials in 1926 were more than 70 per cent above the 1913 base, whereas metals and metal products, chemicals and drugs, and the miscellaneous group were around 30 per cent above 1913.

As the 1926 figures are now the base on which all calculations are made, fluctuations in the month by month determinations do not show us anything at all as to dislocations of price structures, compared with pre-war figures. Thus, the building materials are now given as about 92, whereas the metals are above 97. This would indicate that metals are higher relatively than building materials. Such is the fact with regard to 1926, but certainly it is not the fact with regard to all the long period of years culminating in 1913.

Undoubtedly the new line-up may be regarded as representing present relations, but we have not yet thoroughly forgotten pre-war relationships and the varying degrees of inflation since then. The point is that nothing since the war can be called a representative year and all other comparisons are still going to be made with 1913.

A Curious Automobile Year

AUTOMOBILE production in October was 229,083 units, according to Department of Commerce figures, based on factory sales of passenger cars and trucks in the United States, and similar production in Canada as reported by the Dominion Bureau of Statistics. The drop from production in October, 1926, was 33.4 per cent, against a corresponding drop in September of 34.5 per cent.

This is proving to be a very curious year in the automobile trade. At the beginning of the year the opinion in many quarters was that there would be a drop from the record production of 1926, amounting perhaps to 10 per cent or more. The actual record for the first six months of the year showed only 11.4 per cent decrease, and part of that was fairly attributable to excess production

late in 1926, for January showed 21 per cent loss from January, 1926, while June, when Ford had just gone out of production, showed only 17 per cent decrease from June, 1926.

With 11.4 per cent loss in the first six months of this year, automobile production lost 30.2 per cent in the next four months, the ten-month loss being accordingly 18.8 per cent. With five months of no Ford production, and many prospective buyers apparently waiting for the new model, this 18.8 per cent loss is by no means extreme, considering the common expectation that without any internal complications the automobile industry's activity would fall off this year.

In the same ten months there was a decrease of 6.8 per cent in steel ingot production. According to the findings in the annual review number of THE IRON AGE, the automobile industry in 1926 absorbed about 14 per cent of the steel made. On this basis the 18.8 per cent decrease would account for 2.7 per cent decrease in steel production this year, or two-fifths of the total 6.8 per cent decrease.

Some of this deficiency in automobile production will be made up in the next few months. Many buyers are awaiting the new Ford model, and not a few others are believed to be awaiting an expected price response in other cars to the new Ford's advent. Colonel Ayres of the Cleveland Trust Co. opens his last circular with the words: "Shortages are in the making in iron and steel, and automobiles, and railroad equipment." He goes on to remark that such a condition is unusual, for downward swings in production in the past occurred while inventories were being reduced. The country had got "long." Now, he contends, the country is "short" in several items. In automobiles there seems to be a clear case.

Accident Emergency Crews

ONE phase of protection against industrial accidents which has been especially developed in recent years is the organization among the workers of emergency men who are to act instantly in certain situations. The most common of these are cases of asphyxiation in its various forms —drowning, smothering in substances under process, inhalation of gases and electric shock. The presence of a competent first-aid man, or better still a team, may save life where even a short wait would snuff it out.

This practice had its beginning in public utilities and in industries in which asphyxiation is always present as a hazard. In the utilities commercial gas poisoning and, naturally more frequent, electric shock are to be guarded against. The resort almost without exception is to the so-called prone method of resuscitation where life is passing because the lungs are no longer able to function. All mechanical apparatus has been cast aside. In drowning accidents the old-time barrel-rolling and arm-pumping are obsolete. The prone method calls for no apparatus. It is so simple that even a child may become an accomplished performer in a very short time. In fact, the Boy Scouts learn it as a part of their routine training.

Some of the large companies encourage their men to become experts and they provide instruction. In some instances every man in a company's employ has been compelled to take it. Crews are trained that the highest possible efficiency may be acquired. Competitive drills between individuals and teams are held. Whoever among employees of gas and electric companies saves a life by this method is entitled to receive the Insull medal, the gift of Samuel Insull. Of course the emergency men, who are employees of the various departments and are apart from the works surgical staff, may include other classes of accidents in which they may render assistance for the moment. But it is for asphyxiation that they are organized.

Emergency aid has saved countless lives. Many persons at first pronounced dead have been restored to full vigor. Because the rescue men were ready the faint surviving spark was fanned to full flame. Persons who have been under water for minutes, others who have been pulled from under smothering dry masses, still others who have received the current from a high potential electric wire, and those who have become unconscious from inhaled poison gas, have responded to the treatment. The skill gained as a part of works routine has been applied many times outside of employment, a trained man chancing to be at the scene of what but for him would be a fatal accident.

CORRESPONDENCE

Airplane Fosters "Weight Mindedness"

To the Editor: Just as the airplane has extended our conception of the speeds at which a human being can travel, so too it has greatly extended the possibilities of weight saving in contemporary engineering design. That weight saving is the prime factor in airplane design is an obvious fact, but that it is actually beginning to influence general design may not be so apparent at first glance.

In the case of the airplane, it is applied directly at every point in a strictly designing sense based on accurate calculations, except where experience has shown that wear, vibration and indeterminate or secondary stresses recommend additional material for assured safety. In machine or structural design, where we have been indoctrinated with the idea that it must be "plenty strong" and husky and we have been inclined to accept bulk as the interpretation of that need, we are learning to investigate our designs more critically and distribute our loads to better advantage with less weight of material. As a result we have structures and machines which put the material where it will do the most good. They weigh and cost less and are more pleasing in appearance because of the greater simplicity of the design.

This development of an attitude of "weight mindedness" on the part of our engineers and draftsmen is but a further demonstration of our versatility in adapting what is best in any field to all fields to which it may apply. Just as the airplane owes much to the automobile for its development, so too other industries are beginning to profit by the experiences and knowledge gained in the aeronautical field.

JOHN F. HARDECKER,
Chief Draftsman, Naval Aircraft Factory.

Philadelphia, Nov. 17.

Revenue freight loaded on the railroads during the week ended Nov. 5 is reported by the American Railway Association at 1,038,852 carloads, a decline of nearly 7 per cent from the 1,112,621 carloads of the preceding week and of over 8 per cent from the 1,131,832 carloads of the corresponding week of last year.

Iron and Steel Markets

Forward Buying Held in Check

Attention Focused on Reducing Inventories—First Quarter Basis Established for Heavy Products but Not for Sheets—Activity in Southern Pig Iron

COMPARED with conditions a week ago, the steel market is quiet. Most consumers of bars, plates and shapes (which in the aggregate represent over 40 per cent of all the steel rolled), got under cover for the rest of the year's needs when prices were advanced twelve days ago. This buying was largely an obligation against late December and early January mill schedules, and output now is barely holding to the October rate.

Sheet users are looking for a corresponding price upturn. Pressure to sell has subsided in most quarters, and buyers meet refusals to enter bookings for 1928 delivery at today's quotations. Meanwhile, with the automobile trade still taking only small lots for immediate use, demand has slackened, and interest is centered on next year's business.

Reports uniformly emphasize unusual stress being directed to approximate zero inventories. Indications thus point to greater general activity in December only on the score of releases against rail contracts and the speeding up of automobile manufacture.

A moderate amount of first-quarter buying in the heavy tonnage products at the new basis of 1.80c., Pittsburgh, is giving some credence to reports of another advance at a time calculated to establish this level firmly for next year's commitments.

On railroad account have come orders for 68,000 tons of rails and 30,000 tons of track accessories in Chicago. Rail mill operations have been stepped up a trifle, with probable sharp increases within two weeks. The Santa Fe is in the market for 3850 miscellaneous freight and 76 passenger cars, requiring some 50,000 tons of steel. The Cudahy Packing Co. has decided to build 200 refrigerator cars in its own shops.

Fresh structural steel inquiries amount to 28,000 tons, including 7000 tons for New York subway construction. Definitely known bookings for the week cover 14,000 tons, with some 7000 tons in addition not fully identified. A Seattle department store will take 2000 to 3000 tons of concrete reinforcing bars.

Bookings of fabricated steel in the first ten months are put at 2,311,860 tons by the Department of Commerce, compared with 2,133,780 tons in ten months last year. Shipments, on the other hand, declined from 2,407,260 tons to 2,187,840 tons.

An oil company has closed on 75 miles of 10-in. pipe. In Chicago 5200 tons of plates were bought, 1200 tons for oil storage tanks. Lake shipyards placed some sizable plate orders for repair work.

Wire nails, now more commonly obtainable at a 2.45c. Pittsburgh basis, are believed to be due for an advance through the issuing of a new card of extras.

Hot-rolled flats have settled to 1.90c., Pittsburgh, for tonnage lots of the wide products and 2.10c., for the narrower than 6 in., except cooperage stock which is still 2.30c.

Buying of cold-rolled strips is in larger volume, but not sufficient to warrant speeding up production.

Pig iron buying shows improvement, particularly in the South and Central West. Southern furnaces, which have opened their books for first quarter at $16, Birmingham, have sold 100,000 tons to pipe foundries, as well as close to 20,000 tons in the Cincinnati district. Cleveland producers booked 23,000 tons, mainly in western Ohio, Indiana and Michigan. Some buyers have used up iron carried over from the third quarter and are combining purchases for the remainder of the year with first quarter contracts.

Along the Eastern seaboard fresh price weakness has developed in territory where Buffalo and eastern Pennsylvania iron are competitive. An Eastern steel company has bought 16,000 tons of basic pig iron. Efforts to rush water shipments before the close of navigation are evident in the East as well as in the Chicago district.

Scrap remains weak except at Pittsburgh, where heavy melting steel has advanced 25c. a ton on fair-sized consumer purchases. The same grade has declined 50c. at Philadelphia and 25c. at Cincinnati.

In view of continued depression in the fuel market, coal operators are not impressed by the mine union's appeal for Presidential intervention in its behalf. Prices of slack grade coal are at the lowest level in a long period.

Steel castings in October made the poorest showing in over two years, both in orders and in production. New orders called for 37 per cent of capacity against 38 per cent in September. Malleable castings showed a good gain in October, but the ten-month bookings were 9 per cent below last year.

THE IRON AGE composite price for finished steel has risen to 2.307c. a lb., from the low of 2.293c., which was held for the four preceding weeks. The pig iron composite price remains unchanged at $17.63 for a second week.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Nov. 22, 1927	Nov. 15, 1927	Oct. 25, 1927	Nov. 23, 1926
No. 2, fdy., Philadelphia	$19.76	$19.76	$19.76	$23.26
No. 2, Valley furnace	17.50	17.50	17.50	19.00
No. 2, Southern, Cin'ti	19.69	19.69	20.94	23.69
No. 2, Birmingham	16.00	16.00	17.25	20.00
No. 2 foundry, Chicago*	18.50	18.50	18.50	21.00
Basic, del'd eastern Pa.	19.50	19.50	20.00	23.00
Basic, Valley furnace	17.00	17.00	17.00	18.50
Valley Bessemer, del. P'gh	19.76	19.76	19.76	21.76
Malleable, Chicago*	18.50	18.50	18.50	21.00
Malleable, Valley	17.50	17.50	17.50	19.00
Gray forge, Pittsburgh	18.76	18.76	18.76	20.26
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	90.00	90.00	90.00	100.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh	34.00	34.00	34.00	36.00
Forging billets, P'gh	38.00	38.00	38.00	40.00
O.-h. billets, Phila	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh	*40.00*	41.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	**1.80**	1.75	1.75	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	**2.12**	2.07	2.07	2.22
Iron bars, Chicago	**1.90**	1.85	1.85	2.00
Steel bars, Pittsburgh	**1.80**	1.75	1.75	2.00
Steel bars, Chicago	**1.90**	1.85	1.85	2.10
Steel bars, New York	**2.14**	2.09	2.09	2.34
Tank plates, Pittsburgh	**1.80**	1.75	1.75	1.90
Tank plates, Chicago	**1.90**	1.85	1.85	2.10
Tank plates, New York	**2.14**	2.09	2.09	2.24
Beams, Pittsburgh	**1.80**	1.75	1.75	2.00
Beams, Chicago	**1.90**	1.85	1.85	2.10
Beams, New York	**2.14**	2.09	2.09	2.34
Steel hoops, Pittsburgh	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Nov. 22, 1927	Nov. 15, 1927	Oct. 25, 1927	Nov. 23, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	*2.75*	2.80	2.80	3.00
Sheets, black, No. 24, Chicago dist. mill	2.90	2.90	3.00	3.20
Sheets, galv., No. 24, P'gh	3.65	3.65	3.70	3.85
Sheets, galv., No. 24, Chicago dist. mill	*3.75*	3.80	3.85	4.05
Sheets, blue, 9 & 10, P'gh	2.10	2.10	2.10	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.20	2.20	2.30	2.50
Wire nails, Pittsburgh	2.50	2.50	2.50	2.65
Wire nails, Chicago dist. mill	2.55	2.55	2.60	2.70
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh	3.20	3.20	3.20	3.35
Barbed wire, galv., Chicago dist. mill	3.25	3.25	3.30	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	**$14.25**	$14.00	$14.50	$17.00
Heavy melting steel, Phila.	*13.50*	14.00	14.00	15.50
Heavy melting steel, Ch'go	11.50	11.50	11.50	13.00
Carwheels, Chicago	13.25	13.25	13.50	14.50
Carwheels, Philadelphia	15.50	15.50	15.50	16.50
No. 1 cast, Pittsburgh	14.25	14.25	14.75	16.00
No. 1 cast, Philadelphia	16.00	16.00	16.50	17.00
No. 1 cast, Ch'go (net ton)	13.50	13.50	14.00	16.00
No. 1 RR. wrot, Phila	15.25	15.25	15.50	17.00
No. 1 RR. wrot, Ch'go (net)	9.50	9.50	10.00	12.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.85	$4.25
Foundry coke, prompt	3.75	3.75	4.00	5.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**13.75**	13.55	13.25	13.87½
Electrolytic copper, refinery	**13.50**	13.25	13.00	13.50
Zinc, St. Louis	**5.82½**	5.67½	5.95	7.17½
Zinc, New York	**6.17½**	6.02½	6.30	7.52½
Lead, St. Louis	**6.05**	6.00	5.95	7.80
Lead, New York	6.25	6.25	6.25	8.00
Tin (Straits), New York	**58.12½**	57.00	58.50	72.50
Antimony (Asiatic), N. Y.	**10.87½**	10.75	11.00	14.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

New Prices on Heavy Rolled Products Hold, But Hot-Rolled Flats Decline

PITTSBURGH, Nov. 22.—The steel market is one of sharp contrasts. Over against the fact that sentiment is cheerful and that the recent price advances in plates, bars and shapes have so impressed buyers with the possibility of generally higher prices that they want to get under cover for their early 1928 requirements, is the fact that November business has been just about on a par with that of October and steel works engagement in this and nearby districts is as low as it has been at any time this year. Steel makers, as well as consumers, are giving inventories close attention, since it has been a year of slim profits and there is the natural desire to make the year-end reports light in the materials item. Such a course is favored by current demand, since it is neither for large lots nor is it as pressing as it would be if there were greater activity among consuming industries.

It is probably liberal to put ingot production in the greater Pittsburgh district at between 55 and 60 per cent of theoretical capacity, since the Youngstown section is not doing as well as 50 per cent. The week also has seen some slipping in sheet and tin mill operations, and the large amount of business in bars, plates and shapes brought in by the recent price stiffening appears to apply largely against late December and early January mill schedules. Mills rolling the steel going to the automotive industry are no busier than they have been, nor is it possible to record any quickening in the activity of wire and pipe mills. Rail mills have speeded up. All in all, so far as mill operations are concerned, it appears that the story for 1927 already has been written.

The price situation is still irregular. While the advance in the heavy tonnage products is holding and some subsidence of selling pressure in sheets is evident from the fact that prices have stopped declining, there is still an unsettled market in wire products and hot-rolled flats have definitely settled to 1.90c. to 1.95c., base, for wide material and to 2.10c. to 2.15c. for stock narrower than 6 in. This decline, amounting to $3 per ton from former quotations, has not, however, affected cooperage stock, which still is quoted at 2.30c., base. Sheet, strip and wire makers, on account of dwindling profits, are in a mood for higher prices, and it is possible that another week will see a move in that direction, particularly in wire nails. Tin plate prices for the first half of next year have yet to be announced; present prices of tin mill black plate and of pig tin, as compared with those of a year ago, allow room for a reduction, but producers do not want to get into the uncomfortable position of obligating themselves for the first six months of next year at a fixed price if there is any possibility of high plate and tin prices during that period.

The Standard Sanitary Mfg. Co. has not yet closed on the iron it invited bids on recently, and not much else has lately been before the market. Scrap has caught the brighter outlook in the finished steel market and has moved up 25c. a ton under the influence of some fair-sized purchases by two steel makers. The fuel situation is as depressed as ever, and it is a long time since slack grade coal could be had as cheaply as it can be today. Coal operators in this part of the country are more amused than alarmed over the efforts of

the miners' union officials to secure Presidential intervention in the strike, which for some time has been regarded as a closed issue here. Even if the union and the operators were brought together, there is doubt that a scale could be agreed upon that would permit profitable operation of the mines in the present state of the market.

Pig Iron.—The Standard Sanitary Mfg. Co. has yet to close against its recent inquiry for foundry iron for the first half of next year, and since this was the only business of importance before makers, the story of the past week is simply told. There is no open market interest in basic iron and the demand for Bessemer, malleable and low phosphorus grades is confined to occasional carloads. Merchant producers are still quoting the prices they have named for several weeks and are hopeful of being able to maintain them against any future sizable demands, since there is the promise of better steel works engagement in another month and this is expected to lessen competition from steel works furnaces.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	18.00
Gray forge	17.00
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Low phosphorus, copper free	27.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Hot-Rolled Flats.—Makers of cooperage stock are still successful in maintaining a base of 2.30c., Pittsburgh, but the general market for hot-rolled flats is weaker and is no longer quotable above 2.15c., base, for narrow strips, which are available at 2.10c. and have even sold for less to buyers who also take wide material. The latter is now quoted at 1.90c. to 1.95c., base. Business is about equal to that of last month but leaves much to be desired.

Cold-Rolled Strips.—The prevailing price is now 3c., base, for lots of 1 to 3 tons, subject to a deduction of 25c. per 100 lb. on lots of 3 tons or more, but mills catering to small-lot consumers whose requirements are exacting still claim success in getting orders at 3.25c., base. General demand is steady enough but lacks volume.

Bolts, Nuts and Rivets.—Important consumers, such as the automobile builders and the railroads, are still taking bolts, nuts and rivets in sparing fashion, and there is not enough buying from other directions to create even a fairly active market. Bolt and nut prices are firmly maintained, but large rivets, though nominally firm, are not subject to much test, since few users failed to contract for this quarter before the price went up Oct. 20.

Ferroalloys.—The leading maker of spiegeleisen is quoting 19 to 21 per cent material at $30 to $33, furnace, according to the tonnage, for contract shipment over the first quarter of next year. This represents a drop to small users who a year ago were quoted $37 on contracts. The spot market on this alloy is still quotable at $30 to $31, as demands are light and supplies are more than ample. Larger consumers did not take out all of the tonnage they contracted for, and commitments for the fore part of 1928 will be lightened to the extent of the unspecified tonnage. No announcement has yet been made as to next year's prices on ferromanganese and ferrosilicon, and forward buying has not started. There is a fair movement of these alloys on existing contracts.

Semi-Finished Steel.—Activity in billets, slabs and sheet bars is still limited, presumably because the market for sheets and strips is not showing much life. The fact that the price of tin plate for the first half of next year is yet to be named is probably delaying the placing of some business for that period and cutting down the requirements of tin bars. It is not a market in which prices can be clearly defined, but makers are quoting $34, Pittsburgh or Youngstown, for sheet bars and small billets and slabs and $33, Pittsburgh or Youngstown, on large billets and slabs. Wire rods are still weak, and while $41 and occasionally $42, base Pittsburgh, are obtained, few worthwhile tonnages are going on makers' books at more than $40, which, as in Cleveland, is now the ruling price.

Bars, Plates and Shapes.—The past week has been notable for active efforts on the part of buyers to secure coverage beyond the end of the year at 1.75c., base Pittsburgh. It is doubtful if the regular customers of any mill will have to pay more than that on tonnage shipped between now and the end of the year, but mills are a unit in refusing to extend protection to irregular and infrequent customers at that price even for this year. The new base of 1.80c. is being closely adhered to, and the position of the mills has been strengthened by the fact that a fairly heavy order book has been created by the rush to cover inspired by the advance of Nov. 10.

Wire Products.—Prices have reached levels where producers with the lowest costs find it difficult to make a profit. Usually such situations are followed by a firmer price stand by the manufacturers, and reports of such a development are already beginning to be heard, especially with reference to nails. Business rarely is active at this time of the year, when the aim of jobbers and manufacturing consumers is the reduction of inventories. Since the makers, rather than distributers, have been carrying the stocks in the past year, inventory considerations may possibly explain the pressure to sell, which has produced the recent price weakness.

Rails and Track Supplies.—Little track accessory business is coming to makers in this district, and the standard-section rail allotment of the New York Central Lines was the last in which the local producing unit shared. Light-section rails are selling steadily in small lots, and the price of $36 per gross ton, base, on billet rails is firmly maintained. There is a common base of $2.80, mill, for large and small spikes, but there is some shading of that price on small spikes.

Tubular Goods.—The Atlantic Oil Producing Co., an Atlantic Refining Co. subsidiary, has placed 75 miles of 10-in. pipe with two local producers for an oil line run-

The Iron Age Composite Prices

Finished Steel

Nov. 22, 1927, 2.307c. a Lb.

One week ago	2.293c.
One month ago	2.293c.
One year ago	2.453c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Nov. 22, 1927, $17.63 a Gross Ton

One week ago	$17.63
One month ago	17.84
One year ago	20.13
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
Del'd Cleveland	1.99c.
F.o.b. Cleveland	1.80c.
F.o.b. Birmingham	1.95c. to 2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.80c. to 1.90c.
F.o.b. Birmingham	2.00c. to 2.10c.

Rail Steel

F.o.b. mill	1.65c. to 1.70c.
F.o.b. Chicago	1.80c.

Iron

Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
C.i.f. Pacific ports	2.30c. to 2.40c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c.
F.o.b. Chicago	1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.
Del'd Cleveland	1.99c.
Del'd Philadelphia	2.12c.
Del'd New York	2.14c.
C.i.f. Pacific ports	2.30c. to 2.40c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.10c. to 2.15c.
Cooperage stock	2.30c.
*All gages, 6 in. and wider, P'gh	1.90c. to 1.95c.
All gages, narrower than 6 in., Chicago	2.40c.
All gages, 6 in. and wider, Chicago	2.20c. to 2.40c.
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Atlantic ports	$1.21
Cotton ties, per bundle 45-lb. out of stock, f.o.b. Gulf ports	$1.20

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.10c. to 2.20c.
Bars, f.o.b. Chicago	2.10c. to 2.20c.
Bars, Cleveland	2.10c. to 2.25c.
Shafting, ground, f.o.b. mill	*2.35c. to 2.80c.
Strips, under 12 in., 1 up to 3 tons, P'gh,	3.00c. to 3.25c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.40c. to 3.55c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.40c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.50
Galvanized nails	4.50
Galvanized staples	3.20
Polished staples	2.95
Cement coated nails	2.50

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.20
Barbed wire, painted	2.95

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.10c. to 2.15c.
Nos. 9 and 10, f.o.b. Chicago dist. mill,	2.20c. to 2.25c.
Nos. 9 and 10, del'd Cleveland	2.24c. to 2.29c.
Nos. 9 and 10, del'd Philadelphia	2.42c. to 2.47c.
Nos. 9 and 10, f.o.b. Birmingham	2.35c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.75c. to 2.90c.
No. 24, f.o.b. Chicago dist. mill	2.90c.
No. 24, del'd Cleveland	2.94c. to 3.04c.
No. 24, del'd Philadelphia	3.07c. to 3.22c.
No. 24, f.o.b. Birmingham	3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.85c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.65c. to 3.75c.
No. 24, f.o.b. Chicago dist. mill	3.75c.
No. 24, del'd Cleveland	3.74c. to 3.84c.
No. 24, del'd Philadelphia	3.97c. to 4.07c.
No. 24, f.o.b. Birmingham	3.95c. to 4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.15c.

Long Ternes

No. 28, 8-lb. coating, f.o.b. mill primes	4.20c.
No. 28, 8-lb. coating, f.o.b. mill unassorted	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.40
15-lb. coating I.C.	14.45
20-lb. coating I.C.	15.80
25-lb. coating I.C.	$17.30
30-lb. coating I.C.	18.75
40-lb. coating I.C.	20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300	(3½% Nickel)	4.00 to 4.10
2500	(5% Nickel)	5.00 to 5.25
3100	(Nickel Chromium)	3.00 to 3.10
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.10 to 3.20
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.00 to 4.15
6100	(Chrom. Vanad. spring steel)	3.60 to 3.80
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.10 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.10 to 3.20
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb
Spikes, ⅜ in. and larger	$2.80
Spikes, ⅛ in. and smaller	$2.75 to 2.80
Spikes, boat and barge	3.10
Tie plates, steel	2.25
Angle bars	2.75
Track bolts, to steam railroads	3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count,	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Iron Inches	Iron Black	Iron Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1¼	30	18
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	45	32½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1¼	30	14
1 to 1¼	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	18
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5 and 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2½ in.	— 2
3¼ to 3¾ in.	42⅙	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	60	3 in.	45
1¼ to 1½ in.	52	3½ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	21	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled			
2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

ning from Midland to Judkin, Tex. Demand for pipe for oil and gas lines is still the only bright spot in the market situation, but the general movement of pipe is at least approximating that of October and there is satisfaction also in the fact that the recent price revisions have brought about a steadier market.

Sheets.—Mills could take on a good deal of first quarter business at today's prices if they were so disposed, but as they are refusing it market activity suffers. It is impossible to record any strengthening in prices as they apply to current shipments or on business for the remainder of the year, but as there has been no further weakening, it is evident that pressure to sell is subsiding. Sheet makers still report only moderate interest in the market by the automotive industry, but the market on body sheets is holding better than that on most other finishes. Mill operations are down somewhat this week, reflecting the caution among buyers growing out of price uncertainty, with 65 per cent of capacity now a fair estimate of mill engagement, as compared with slightly more than 71 per cent last month.

Tin Plate.—An announcement of the price for the first half of 1928 is yet to be made. Current business does not amount to much, and since January shipments on contracts rarely are heavy, not much mill engagement is provided by specifications for that month. Mill operations are not over 60 per cent of capacity.

Cold-Finished Steel Bars and Shafting.—Not much business is coming from the automobile parts makers, but other consuming industries are buying steadily. Makers are talking of the necessity of reflecting the recent advance in hot-rolled bars in their first quarter prices, but this has not been an effective stimulus to forward buying of cold-finished bars. Prices appear steady at 2.20c., base Pittsburgh, for small lots and 2.10c. to preferential buyers in the Detroit district.

Coke and Coal.—The market is not quotably lower on either coke or coal, but it is weaker in tone, since there is more of both for spot delivery than the market can easily absorb and it is frequently necessary for producers to dip under the market prices to move loaded cars. Usually at this time some interest is manifested in coke requirements for the first quarter of the year, but negotiations are yet to start. Moreover, there is some question whether there will be much contracting for furnace coke, since some of the stacks now going are about ready to stop on account of the low level of pig iron prices. Steam slack coal has lately sold as low as 75c. per net ton at mine and can still be had as low as 80c.

Old Material.—The market has finally made a turn. Two steel makers in this district have appeared in the market for tonnages of heavy melting steel and do not appear to have been able to develop lower prices than $14.25, and as much as $14.50 is now being paid by dealers against older sales on which shipments had been suspended until the past week. Some strictly No. 1 railroad steel has been sold at $15, which also represents an advance of 25c. per ton over the last previous sale of such material. Compressed sheets also are about 25c. a ton higher on sales into consumption. The market generally is a little firmer in tone, since dealers now look for larger demands, notably from steel makers, and also are impressed by the smallness of offerings at present prices, to say nothing of the fact that heavy melting steel failed to go through $14 in a month of the lightest trading experienced in recent years.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$14.25 to $15.00
Scrap rails	13.50 to 14.00
Compressed sheet steel	13.75 to 14.00
Bundled sheets, sides and ends	12.75 to 13.00
Cast iron carwheels	14.00 to 14.50
Sheet bar crops, ordinary	14.50
Heavy breakable cast	13.25 to 13.75
No. 2 railroad wrought	14.00 to 14.50
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	11.00 to 11.50
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.00 to 16.50
Railroad coil and leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phosphorus billet and bloom ends	18.00 to 19.00
Low phosphorus, mill plate	17.00 to 18.00
Low phosphorus, light grade	16.00 to 17.00
Low phosphorus sheet bar crops	17.00 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.00 to 11.50
Short mixed borings and turnings	11.00 to 11.50
Cast iron borings	11.00 to 11.50
No. 2 busheling	8.00 to 8.50
Rolling Mill Grades:	
Steel car axles	18.00 to 19.00
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	17.00 to 17.50
Cupola Grades:	
No. 1 cast	14.25 to 14.75
Rails 3 ft. and under	15.00 to 15.50
Malleable Grades:	
Railroad	14.00 to 14.50
Industrial	13.50 to 14.00
Agricultural	13.00 to 13.50

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.20c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	62½ per cent off list
Machine bolts, per 100 count	62½ per cent off list
Carriage bolts, per 100 count	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	2.90
Wire, galvanized soft, base per 100 lb	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

Pyrometric Don'ts

C. E. Foster of the Foster Instrument Co., Ltd., Letchworth, England, writing in the *Edgar Allen News* for October, 1927, recommends a series of precautions for the pyrometer user. While many of the prohibitions appear self-evident, they doubtless are frequently violated by the unthinking user. He says:

Don't use asbestos insulation where it can get damp. It may act as an electrolyte between compensating leads, or at least cause grounding or short circuits.

Don't use twisted points. Solder or weld them, so the resistance shall be small and constant.

Don't use flimsy terminals. They should be large enough to clean easily and to endure firm tightening.

Don't use lighting circuit or telephone plugs, jacks or switches in the circuits. They are cheap but their resistance may be large, or variable, which is worse.

Don't assume that a finely divided or open scale on the recorder means that the pyrometer will have unusual accuracy.

Don't assume that one type of instrument can be best for both plant and laboratory. In general the plant demands much more ruggedness.

Don't let the purchasing agent select the pyrometer for you. He may think that "a pyrometer is a pyrometer" whereas he would laugh at the idea that "an automobile is an automobile."

Don't think that a pyrometer will cure all the temperature troubles. They merely show where the troubles are.

When replacing pyrometers, don't assume that the old one is correct. Be sure of the new one.

Don't throw the pyrometer away because it doesn't agree with the heat treater's guess. The "human eye pyrometer" isn't as accurate as that.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾ in.	$33.50 to 34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c.
Sheared	1.80c.
Universal	1.80c.

Wire Rods

	Per Gross Ton
*Common soft, base	$40.00 to $42.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $42 to $43. Cleveland mill base, $40.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron,	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c. to 40c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.10 to $10.35

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $3.00
Foundry, f.o.b. Connellsville prompt	3.75 to 4.50
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.45 to 9.85
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.65 to 1.85
Mine run gas coal, f.o.b. Pa. mines	1.85 to 2.00
Steam slack, f.o.b. W. Pa. mines	0.80 to 1.00
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$30.00 to $31.00
Domestic, 16 to 19%	29.00 to 30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$32.00	12%	$36.00
11%	34.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$25.00	10%	$30.00
7%	26.00	11%	$2.00
8%	27.00	12%	$4.00
9%	28.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	93c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$16.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discount of 70 per cent off on bolts and nuts applies on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75 to $3.00
F.o.b Chicago	2.85 to 3.10

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 55c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Sante Fe Inquires for 4000 Cars—Two More Boatloads of Pig Iron Arrive

CHICAGO, Nov. 22.—A formal inquiry has come from the Santa Fe for 3850 miscellaneous freight cars and 76 passenger cars, requiring in all not less than 50,000 tons of steel. This business reached the market at a time when the outlook was none too bright, because of reports that the Pere Marquette had withdrawn its inquiry and that the Cudahy Packing Co. had purchased specialties and will build 200 refrigerator cars in its own shops.

Structural awards have bounded up, and fresh inquiry gives added promise. Except for one bridge in prospect for the Rock Island, the railroads are not greatly interested at this time in structural material.

Mill prices of plates, shapes and bars have gained strength at the new quotation of 1.90c., Chicago, in tonnage lots. Sales are equal in volume to production, but the bulk of transactions is for delivery at close range, it being the purpose of users to avoid accumulations either of tonnage or obligations as the inventory period approaches. Several large manufacturers, including one automobile producer, have already closed for 10-day to two-week periods to take stock.

Ingot production remains stationary for another week, and based on recent sales a change is not expected by the trade unless releases against rail contracts are forthcoming. The Inland Steel Co. still has its No. 4 furnace under fire but has not put it in production. The leading producer is holding two furnaces banked, one at Gary and one at the South Chicago works.

Pig Iron.—Two cargoes of boat iron, a total of 4500 tons, have been unloaded at Milwaukee and Chicago. Additional shipments which may arrive before the close of navigation are now estimated by the trade at 10,000 tons. The bulk of this iron is moving within a range of $18 to $18.50, depending on the size of the order, because it is figured that the seller must bear the burden of carrying charges resulting from the span of time between lump delivery and the time that the iron is melted. A part of each boatload, often characterized as mixed iron, must be sold from the dock for quick turnover, and this iron, about 500 tons this week, has sold in some instances at $17.50. As a general thing, this market is moderately active. Spot sales are numerous, and users are showing greater interest in first quarter iron. The November rate of shipments is holding close to that of October. The extent of bookings from week to week is difficult to gage for the reason that few open inquiries appear in the market, most sales being made quietly.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil.	18.50
High phosphorus	18.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	20.18
Low phos., sil. 1 to 2 per cent, copper free	$30.50 to 31.00
Silver, sil. 8 per cent	31.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Reports of an advance in ferromanganese appear to be without foundation. Users in this market are showing interest only in carload lots. Specifications for ferrosilicon are in fair volume. Announcement of 1928 contract prices has not been made. Spiegeleisen in the 19 to 21 per cent grade has been offered to users for delivery over the first half of 1928 at $30, Hazzard, Pa.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $37.76 to $38.76.

Plates.—A feature of this market is the steadiness of miscellaneous orders, coupled with those from oil producing centers, affording local mills shipments of steel plates at a rate about equal to ingot output. Production of this commodity matches well with output of mild steel bars, in spite of the fact that car builders, admittedly heavy users of plates, are practically out of the market. A west Texas oil refiner has ordered 7000 tons of plates for storage tank construction, and the Gulf Refining Co. has purchased 1200 tons for delivery in the same district. A local producer has taken, in addition to the above tonnage, 4000 tons in a single order for purposes not identified with the oil industry. Interest in railroad equipment continues to lag, though several more railroads have asked for figures for budget purposes. Car shop operations have been cut close to the bone, and in at least one instance a builder has given up efforts to hold its organization intact. Local sellers have all adopted 1.90c., base per lb., Chicago, as the tonnage price for plates, with 2c. as the quotation for 100 tons or less. Sales this week are all for delivery at close range and indicate that the new price has taken hold. Most shipments, however, are being made against old orders, which were taken at lower price levels, and there is little or no inclination on the part of buyers to make purchases for delivery after the turn of the year.

Mill prices on plates per lb.: 1.90c., base, Chicago.

Structural Material.—Structural awards total more than 3000 tons. To the American Bridge Co. is to be credited 1500 tons for the Crawford Avenue bascule bridge and 1100 tons for the Memorial Young Women's Christian Association Building. On the active pending list are the Stop and Shop Building, the Chicago *Daily News* printing plant and office building and the Medinah Athletic Club. Contracts for the foundation of the printing plant have been awarded, and plans for the superstructure are completed and awards are ready to be made as soon as permission for air rights is granted. Bridges figure prominently in new business before the trade. The city of Chicago will place two new bascule bridges, one at Robey Street requiring 1200 tons and one on South Clark Street calling for 1800 tons. The Rock Island will place 500 tons for a bridge in Oklahoma. Current mill prices in structural shapes are 1.90c., base per lb., Chicago, on tonnage lots and 2c. for 100 tons or less. Most shipments, however, are being made against orders placed at lower prices.

Mill prices on plain material per lb.: 1.90c., base, Chicago.

Cast Iron Pipe.—That efforts by pipe producers to advance prices are bringing results is indicated by an order received this week by James B. Clow & Sons for 400 tons of 6-in. pipe for delivery to Lansing, Ill. The price was $29, Birmingham, the equivalent of $37.20, delivered Chicago. The National Cast Iron Pipe Co. has taken 13,000 ft. of 6 to 12-in. pipe for Wayne County, Mich., and 34,000 ft. of 8-in. to 12-in. pipe for Downers Grove, Ill. Chicago will receive bids Nov. 28 on 600 tons of 4 and 8-in. Class B pipe. On the whole this market is not unduly active, and inquiry now before the trade is largely for small tonnages for prompt delivery. Several inquiries from public utilities are of this order. Deliveries range from prompt to 25 days, depending on the size of pipe required.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $34.70 to $37.20; 4-in., $38.70 to $41.20; Class A and gas pipe, $4 extra.

Rails and Track Supplies.—Three railroads with terminals at Chicago have placed a total of 68,000 tons of standard-section rails with local producers. Fresh inquiry is active, and the total for the country as a whole is estimated by the trade at not less than 300,000 tons. Rail mill operations in this district are up a trifle, the average now being not far from 45 per cent of capacity. Additional releases are to be expected soon, and producers look for a sharp increase in output about the 1st of December. Western mills have booked 30,000 tons of track accessories, and inquiry before the trade is for about the same tonnage. Shipping instructions on track supplies are slow in reaching producers, and the trend in output is somewhat uncertain.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per Lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Sheets.—Output is lighter, the average being about 60 per cent of capacity for the hot mills in this district. Competition, particularly in outlying districts, is unusually keen, and prices on black and galvanized sheets are lower. Common quotations now are 2.90c., district mill, for black and 3.75c. for galvanized sheets. Agricultural implement manufacturers are specifying at a steady rate, but in other industries the inventory period is having its effect on business. Orders from warehouses are fair, and it is the impression among producers that much business is being diverted through that channel because of the better service rendered on small orders. Mills are considering announcing first quarter prices in the next week or 10 days.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 2.95c.; No. 24 galvanized, 3.80c.; No. 10 blue annealed, 2.25c. to 2.30c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Reinforcing Bars.—New business continues to taper as the weather grows more severe. This applies more to the large projects than to those taking small tonnages, for the reason that the latter can be rushed to completion before extreme low temperatures arrive. Outstanding this week is an order for 700 tons of rail steel bars for the Shedd Aquarium, Chicago. Shop operations stand at 60 to 70 per cent, having been held in that range by urgent requests for rush shipments on old contracts. This rate of output is cutting deeply into backlogs. Prices, which might be expected to strengthen under the influence of the recent advance in mill prices on merchant steel bars, are soft, competition being more of a factor than changes in prices by producers. Awards and fresh inquiries are shown on page 1487.

Cold-Finished Bars.—Both new business and specifications from miscellaneous users are steady, but output is low because of lack of demand from the automotive industry. Most orders, which are individually small, are being taken at 2.20c., Chicago.

Cold-Rolled Strip.—Weakness continues to hold sway over prices for this commodity. In 1 to 3-ton lots schedules call for 3.25c., per lb., Cleveland, but orders are commonly taken at $2 to $3 below that figure. Output averages close to 55 per cent of capacity. New orders this week are in larger volume, but the total does not warrant speeding up production.

Bars.—Purchases of mild steel bars are more numerous, the total comparing favorably with output, which is not far from 62 per cent of capacity. Mills have not announced first quarter prices, and they evidently hesitate to do so, for the reason that buyers at every turn are intent on cutting stocks in view of the approaching inventory period and have no interest in shipments which may be made after the turn of the year. A large motor car builder in this district has stopped operations for 10 days to take inventory. This move and others similar to it indicate a slowing down of shipments throughout the next three or four weeks. Current sales are at 1.90c., base per lb., Chicago, for orders of 100 tons or more and at 2c. for smaller lots. Alloy steel bars are in lighter demand, and production has been cut to 55 per cent of capacity. Prices, while little disturbed at present, are showing signs of weakness. Specifications for iron bars are light, and new buying is slow at 1.90c., Chicago. Shipments of rail steel bars have again hit a good stride, so that mills in this district continue on a double turn basis. Stocks in the hands of users are small, and the inventory period is having a less pronounced effect on shipments than in former years. Orders for fence posts are light, and producers are turning their attention to building up stocks of this commodity. Rail steel bars are steady at 1.80c., local mill.

Mill prices per lb.: Soft steel bars, 1.90c., base, Chicago; common bar iron, 1.90c., base, Chicago; rail steel bars, 1.80c., base, Chicago.

Wire Products.—Curtailment of building operations, more pronounced in city than in rural districts, and the approach of winter in farm areas have resulted in a decline in orders for wire products. In those parts of the country where work can be carried on well into the winter, a slackening in the rate of ordering is not in evidence. Business in nails is dull and prices, except on small lots, are generally $2.55, Chicago.

Coke.—Shipments of by-product foundry coke are lighter. Spot sales are at $9, local ovens, and $9.50, delivered in the Chicago switching district. Contract prices for 1928 have not been announced, though some users have made inquiry for delivery in that period.

Bolts, Nuts and Rivets.—Specifications for these commodities are steady, and prices are firm except on small rivets. The practice of holding inventories to the minimum is given as the reason for a smaller volume of spot sales.

Old Material.—Prices are nominal. Here and there among dealers a note of optimism is shown, but events in the market do not lend support to this feeling. The movement of producers' scrap is in smaller volume, and country scrap is moving only in outlying districts. Railroad shipments are steady, but old orders are absorbing them and distress tonnage is giving little trouble to sellers. The demand for foundry scrap is light, especially in the malleable grades.

Prices delivered consumers' yards, Chicago:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$11.50 to	$12.00
Shoveling steel	11.50 to	12.00
Frogs, switches and guards, cut apart, and miscellaneous rails	12.75 to	13.25
Hydraulic compressed sheets	10.00 to	10.50
Drop forge flashings	9.00 to	9.50
Forged, cast and rolled steel carwheels	14.00 to	14.50
Railroad tires, charging box size	14.00 to	14.50
Railroad leaf springs, cut apart	14.00 to	14.50
Acid Open-Hearth Grades:		
Steel couplers and knuckles	13.00 to	13.50
Coil springs	14.75 to	15.25
Low phosphorus punchings	13.00 to	13.50
Electric Furnace Grades:		
Axle turnings	11.50 to	12.00
Blast Furnace Grades:		
Axle turnings	10.00 to	10.50
Cast iron borings	9.50 to	10.00
Short shoveling turnings	9.50 to	10.00
Machine shop turnings	7.00 to	7.50
Rolling Mill Grades:		
Iron rails	13.00 to	13.50
Rerolling rails	13.50 to	14.00
Cupola Grades:		
Steel rails less than 3 ft	14.50 to	15.00
Angle bars, steel	13.25 to	13.75
Cast iron carwheels	13.25 to	13.75
Malleable Grades:		
Railroad	12.50 to	13.00
Agricultural	12.00 to	12.50
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	23.00 to	25.00
*Relaying rails, 65 lb. and heavier	26.00 to	31.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	13.50 to	14.00
Iron arch bars and transoms	17.75 to	18.25
Iron car axles	20.00 to	20.50
Steel car axles	14.50 to	15.00
No. 1 railroad wrought	9.50 to	10.00
No. 2 railroad wrought	10.00 to	10.50
No. 1 busheling	8.50 to	9.00
No. 2 busheling	4.50 to	5.00
Locomotive tires, smooth	12.50 to	13.00
Pipes and flues	7.00 to	7.50
Cupola Grades:		
No. 1 machinery cast	13.50 to	14.00
No. 1 railroad cast	12.50 to	13.00
No. 1 agricultural cast	12.50 to	13.00
Stove plate	11.75 to	12.25
Grate bars	10.75 to	11.25
Brake shoes	10.00 to	10.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.20c. to 2.65c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb.	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Fresh Weakness in Pig Iron—November Steel Bookings Show Gain over October

NEW YORK, Nov. 22.—Keen competition for pig iron business, particularly in New Jersey, has had an adverse effect on prices of both eastern Pennsylvania and Buffalo irons. As low as $18.50, base furnace, has been quoted by eastern Pennsylvania producers on foundry iron, and at least one Buffalo maker is naming a price of $16.50, base furnace. A sale of 500 tons of foundry iron in New Jersey was made at a price of less than $20, delivered. This iron, which is being shipped by barge and rail from Buffalo, figured back to close to $16, furnace. Most Buffalo producers are adhering to $17 base, but in some instances are waiving silicon differentials. Barge canal shipments of iron will soon cease to be a factor in the market. The season of navigation on New York State canals will close on Nov. 25 for wooden barges and on Nov. 30 for steel boats. Meanwhile eastern New York State furnaces are making strenuous efforts to get shipments under way that were delayed by the recent high water. Sales by local brokers during the week totaled 6000 tons. Although buying for first quarter has not yet been heavy, melters are showing increasing interest in iron for that delivery. One current inquiry for first quarter calls for 1500 tons, and another for 500 tons. Two inquiries for first half are for 500 and 300 tons respectively. The Thatcher Co., Newark, N. J., which was in the market for 500 tons for its Garwood, N. J., plant, has bought, and the Crane Co., Bridgeport, Conn., which inquired for 500 tons of high silicon malleable, has closed for 1000 tons of iron. The Burnham Boiler Corporation, Irvington, N. Y., has bought only a small portion of its requirements for Elizabeth, N. J., and has taken no action against its 1000-ton inquiry for Lancaster, Pa. Except in portions of New England affected by the recent flood, foundry melt is holding its own and in some cases is increasing. The Port Henry, N. Y., furnace which blew out some time ago is expected to resume operations within the next four weeks.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$21.41 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	19.89 to 21.52
East. Pa. No. 2 fdy., sil. 2.25 to 2.75	20.39 to 22.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	20.89 to 22.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Ferroalloys.—To forestall, in part at least, a possible advance in the price of ferromanganese for 1928 delivery, some consumers are reported to be specifying quite heavily on their "requirement contracts" with some producers. So far as can be learned no steps have yet been taken to name a price for next year's delivery and naturally, as the year draws to an end, there is very little new buying of either ferromanganese or spiegeleisen. Such as there is is confined to carload and small lots. Specifications on existing contracts are good for both of the manganese alloys and for other standard ferroalloys.

Cast Iron Pipe.—Purchasing by private water and gas companies continues, and a good volume of small tonnages is being closed in addition to the heavier requirements before the market. No action has yet been taken on the pipe for such large buyers as the Federal Water Supply Co., New York, and the United Gas Improvement Co., Philadelphia. Prices are showing more firmness as makers increase the tonnages on their books, but no definite advance in quotations is reported as yet.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $36.25 to $37.25; 4-in. and 5-in., $41.25 to $42.25; 3-in., $51.25 to $52.25; Class A and gas pipe, $4 to $5 extra.

Warehouse Business.—Demand is fairly active for small lots of material from stock, and prices of plates, shapes and bars are slightly firmer, concessions from the established schedule being rather uncommon. Sheets, however, are moving at slight reductions from the bases of 4.20c. per lb. for black and 4.95c. per lb. for galvanized. Total business in November is expected to compare favorably with that of October.

Finished Steel.—Following the recent advance on plates, shapes and bars, some small sales have been made at 1.80c., Pittsburgh, the new price for carload lots, to buyers who did not protect themselves at the old prices, but most of the trade is covered on requirements to Jan. 1. Leading steel mills are not making engagements on these products for first quarter, and before their books are opened it is expected that a further advance to 1.90c., Pittsburgh, will be announced, the effect of which probably will be to drive in first quarter

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.30c.
Flats and squares	3.80c.
Cold-rolled strip, soft and quarter hard,	6.00c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage),	3.84c. to 3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1 to 3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.90c. to 4.00c.
No. 22	4.05c. to 4.15c.
No. 24	4.10c. to 4.20c.
No. 26	4.20c. to 4.30c.
No. 28*	4.35c. to 4.45c.
No. 30	4.60c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.50c. to 4.60c.
No. 20	4.65c. to 4.75c.
No. 22	4.70c. to 4.80c.
No. 24	4.85c. to 4.95c.
No. 26	5.10c. to 5.20c.
No. 28*	5.35c. to 5.45c.
No. 30	5.75c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

contracts at 1.80c. Encouraged by the almost complete unanimity with which mills have advanced $1 a ton on the heavy tonnage products, the leading makers of sheets are preparing the ground for higher sheet prices. Several sheet makers have informed their customers that higher quotations may come this week. Just what they will be is not definitely known, but probably 2.85c. on black, 3.75c. on galvanized and 2.20c. or 2.25c. on blue annealed. Business in plates, shapes and bars and also in sheets has been somewhat better in the past week, but the tonnage placed is for estimated requirements for December only, with a little for the remaining week of this month, and it is not expected that it will increase rolling mill schedules to any extent. Actual bookings, however, will be considerably larger than in October. There is no change in the situation with respect to hot and cold rolled strip steel except that the latter shows a little more weakness, with $3, base, being shaded on larger lots, which take a 25c. per 100 lb. deduction from the base price. Wire nails are weak, sales having been made in this market at $2.45 per 100 lb. keg, Pittsburgh base. Sales of sheets in the past week have usually been at 2.75c. for black, 3.65c. for galvanized and 2.10c. for blue annealed, with slightly less on the narrow widths of blue annealed in the heavy gages.

Mill prices per lb., delivered New York: Soft steel bars, 2.14c.; plates, 2.14c.; structural shapes, 2.14c.; bar iron, 2.14c.

Reinforcing Bars.—No large tonnages of bars have been reported let in the last week, and the volume of small-lot business has not been up to the average of the last two months. Added to the large aggregate of pending work is a garage and service station in Manhattan which will require from 200 to 300 tons. Prices are unchanged.

Coke.—Prices show no change, and demand is confined to small purchases for current use. Standard foundry is quotable at $4 to $4.25 per net ton, Connellsville, and standard furnace at about $3, Connellsville. Delivered prices on Connellsville foundry coke are: To northern New Jersey, $8.03 to $8.28; to New York or Brooklyn, $8.79 to $9.04; to Newark or Jersey City, N. J., $7.91 to $8.16. By-product foundry coke, as a result of a recent reduction in freight rates to Newark and Jersey City, N. J., from the local producer's plant, is quoted at $9.45 to $9.85 per net ton, delivered. West Virginia by-product foundry coke is quoted at $9.46 per net ton, delivered Newark or Jersey City.

Old Material.—Despite efforts of sellers to maintain the market at about its present level, the downward trend of prices is still in evidence. A tonnage of No. 1 heavy melting steel is reported to have been closed with an eastern Pennsylvania consumer at less than $14 per ton, but brokers are still purchasing at $13.50 per ton, delivered on old contracts. Yard steel is quoted by dealers at $10.50, delivered Phoenixville or Pottsville, Pa., and $10, delivered Harrisburg. These prices actually net the seller less than a shipment to western Pennsylvania, where certain brokers point out that $12.50 per ton is obtainable, or deducting the freight rate of $5.30 per ton, about $7.20 per ton. New York. Machine shop turnings are unchanged at $10 to $10.50 per ton, delivered, but stove plate is not quotable at better than $12 to $12.50 per ton, delivered. One eastern Pennsylvania user of machine shop turnings is reported willing to purchase at $11 per ton, delivered, provided an equivalent tonnage of yard steel and stove plate is furnished with the turnings. In the past week offerings of scrap by the New Haven railroad have totaled about 6000 tons. The Boston & Maine Railroad opened bids today on about 2000 tons, and the Seaboard Air Line, on 1500 to 2000 tons.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb.	$2.90
No. 9 galvanized wire, per 100 lb.	3.35
Common wire nails, base per keg	2.90

*Net base, including boxing and cutting to length.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.25 to 6.75
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	8.25 to 8.50
Locomotive grate bars	8.25 to 8.50
Machine shop turnings	6.00 to 7.00
Short shoveling turnings	6.50 to 7.50
Cast borings (blast furnace or steel works)	6.75 to 7.25
Mixed borings and turnings	6.00 to 7.50
Steel car axles	15.75 to 16.25
Iron car axles	23.25 to 23.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.75
Forge fire	6.50 to 7.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	10.00 to 10.50
Cast iron carwheels	11.25 to 11.75
Stove plate (foundry)	8.75 to 9.25
Malleable cast (railroad)	10.00 to 10.50
Cast borings (chemical)	11.50 to 12.00

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$14.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50
No. 2 cast (radiators, cast boilers, etc.)	11.50

Cleveland

Advance Drives in Business in Plates, Shapes and Bars—Pig Iron Active

CLEVELAND, Nov. 22.—A good volume of orders for shipment during the remainder of the year was brought out during the week by the price advance of $1 a ton on steel bars, plates and structural material, and manufacturers of these lines of steel are taking a brighter view of the situation, which also appears to be reflected in the feeling of many consumers, who believe that better steel prices will help their business. Some buyers have attempted to place tonnage at 1.75c., Pittsburgh, to carry them into the first quarter, but mills are holding firmly to their stand to make no commitments at that price for material to be carried over into the new year. One producer has opened its books for the first quarter at the 1.80c. price and has closed a few contracts for that delivery. While most buyers got under cover for the remainder of the year at the old price, some small-lot current orders have been taken at 1.80c. The greatest activity has been in steel bars, although the price advance has brought out some good orders for plates and structural material.

Fairly good demand has developed from the Lake shipbuilding industry. One shipbuilding company has placed 1000 tons of plates and shapes for repair work at its Chicago yards, a Toledo ship yard is low bidder for a car ferry requiring 800 tons, and the Great Lakes Engineering Works has taken a ferry for Detroit River service requiring 600 tons. Some large-lot business was taken in steel bars. In structural lines bridge work was placed in Cleveland during the week requiring 1800 tons. New structural inquiry is light. There is an inquiry for 1500 tons of heavy plates for work in Waterville, N. C.

Pig Iron.—Considerable activity developed in pig iron in western Ohio, Indiana and Michigan in the past week, during which Cleveland interests sold 23,000 tons in foundry and malleable grades in lots up to 2000 tons. Some buyers who have been melting iron carried over from the third quarter have about used up that iron and are combining purchases for the remainder of the year with first quarter contracts. The business is scattered among makers of automobile parts, machinery manufacturers, implement makers and jobbing foundries. In Cleveland, activity was confined to car lots for early shipment. First quarter business is being taken at the prices that have been prevailing recently, the market showing neither a firmer nor a weaker tone. Lake furnace prices range from $16.50 to $17. One-half of the silicon differential is usually being waived on high silicon iron. For Cleveland delivery and in Michigan the market is steady at $18, furnace. Some of the sellers are now actually soliciting first quarter business, and a moderate volume of

inquiry is pending for that delivery. One producer has inquiries for 10,000 tons, in addition to the inquiry from the Standard Sanitary Mfg. Co. for 5000 to 10,000 tons of Northern iron for its Louisville, Ky., plant. Shipping orders are in about the same volume as during October. The automotive industry is taking no more iron than last month, but producers look for larger specifications from this source in December.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.50
Ohio silvery, 8 per cent	30.00
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Iron Ore.—Lake shipments for the season are over with the exception of a few straggling cargoes. During October 4,023,982 tons of Lake Superior ore was consumed, or 65,511 tons less than during September. The total amount at furnaces Nov. 1 was 34,952,055 tons, and the total amount at furnaces and Lake Erie docks was 42,163,529 tons, as compared with 42,003,715 tons on the same date a year ago. There were 145 furnaces that use Lake ore in blast Oct. 31, a decrease of six for the month. Furnaces in the Central district used 1,997,935 tons of Lake ore in October, a decrease of 32,171 tons for the month, and Lake front furnaces consumed 1,793,940 tons, a decrease of 48,440 tons. Eastern furnaces used 91,215 tons, a gain of 11,456 tons, and all-rail furnaces consumed 140,892 tons, an increase of 3644 tons.

Coke.—The market is sluggish in all grades. Some of the better grades of Connellsville foundry coke are held at $4.50 per ton, but others are available at $3.75, ovens. Foundry heating coke ranges from $2.50 up to $3.15, ovens. By-product coke for domestic use is hard to move.

Bolts, Nuts and Rivets.—Orders for bolts and nuts showed a noticeable gain in the past week. Two of the General Motors units placed specifications for fair-sized lots to cover their requirements for January and February. The Ford Motor Co. is expected to come into the market in the next few days. Orders from the jobbers show a little gain. The demand for rivets has also improved, as a result of the release of some orders by the railroads. Prices on both products are being maintained.

Semi-Finished Steel.—There is little new demand, and specifications continue light, orders being limited to early needs. Prices are being well maintained.

Sheets.—A Cleveland stamping manufacturer has placed a round tonnage of blue annealed sheets for Chevrolet running boards for delivery over the next six months, but other orders in this territory are for small lots. Not much business is coming from the automotive industry in Michigan, and no round-lot inquiries have yet come from the Ford Motor Co. The tone of the market continues weak. On black sheets 2.75c., Pittsburgh, is now rather common. In this market 2.05c., Pittsburgh, appears to be the minimum on blue annealed sheets. On galvanized sheets 3.65c. is the common quotation with both Pittsburgh and Ohio mill basing points. Users of metal furniture sheets are seeking concessions from present quotations, feeling that they are entitled to prices based on the present black sheet price with the usual differentials.

Strip Steel.—Prices on hot-rolled strip steel are still very unsettled, particularly on wide material, 1.90c., Pittsburgh, being rather common on strip 6 in. to 12 in. wide and as low as 1.75c. being reported on wider material. Cold-rolled strip appears no firmer than recently, some mills going to 3c., Cleveland base, for 1 to 3 tons. The demand for hot-rolled strip is very light, and cold-rolled material is not very active.

Reinforcing Bars.—A local mill has taken 700 tons for viaduct work in connection with the Cleveland Union Terminals project. Not much new inquiry is coming out. Rail steel bars appear slightly firmer, being quoted at 1.65c. to 1.70c. at mill.

Warehouse Business.—Orders are light, and with some of the jobbers sales are not keeping up to the October volume. There has been a fair seasonal demand for sheets, but this now shows a falling off. Prices are being well maintained.

Old Material.—There is a limited demand from dealers for heavy melting steel and blast furnace scrap for shipment to a local mill, and a small tonnage was purchased during the week at $13.50 for No. 1 heavy melting steel, $13 for No. 2, and $10.50 for blast furnace grades. There is no new consumer demand, and mills that are regulating shipments are not taking scrap in any more liberal quantities than recently. Some of the consumers in this district have temporarily discontinued the use of borings and turnings in their blast furnaces, because they are not anxious to keep production high, and it is evidently because of this that the demand for blast furnace scrap has virtually disappeared. Railroad malleable is lower. Other quotations are unchanged. With the present low prices, dealers are resisting further concessions.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.50
No. 2 heavy melting steel	13.00
Compressed sheet steel	$12.50 to 12.75
Light bundled sheet stampings	11.00 to 11.50
Drop forge flashings	12.00 to 12.50
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 13.75
No. 1 busheling	11.50 to 11.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.50 to 10.75
Mixed borings and short turnings	10.50 to 10.75
No. 2 busheling	10.50 to 10.75
Cupola Grades	
No. 1 cast	16.00 to 16.50
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

Philadelphia

Steel Orders Have Increased Following Advance in Prices

PHILADELPHIA, Nov. 22.—Orders for finished steel, particularly plates, shapes and bars, have increased during the past week, following the announcement by nearly all makers of those products of an advance to 1.80c., Pittsburgh. Buyers have taken advantage of the protection afforded them to the end of the year at the former prices, and a considerable number of dormant projects have come to life when faced with the probability of higher prices if there was further delay. The total volume of orders received by some companies this month will considerably outstrip any recent month. It is doubtful whether the increased bookings will make any material increase in steel plant operations over

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, ⅛-in.	2.80c. to 3.00c.
Structural shapes	2.50c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.50c. to 2.60c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.25c. to 5.25c.
Cold-finished steel, squares and flats	3.75c. to 5.75c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.25c. to 4.35c.
Galvanized sheets (No. 24)	5.10c. to 5.20c.
Blue annealed sheets (No. 10)	3.20c. to 3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅛-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

the remainder of the year, but rolling mills will have a somewhat better arrangement of schedules upon which to operate.

As the price advance announced first by Carnegie Steel Co. and followed by other mills was a surprise to many buyers and even to some of the steel companies, it has taken the trade a week or so to become adjusted, and the real test will come when consumers take up their first quarter requirements. If the leading steel companies adhere to what seems a determination to put prices on a more profitable basis, there will be an irreducible minimum on plates, shapes and bars even to the largest buyers. Neither buyers nor mills seem ready to consider first quarter tonnage.

Aside from the placing of orders for upward of 16,000 tons of basic iron, the pig iron market continues dull and weak. The scrap market is also dull, and some grades have declined in price, notably heavy melting steel.

Pig Iron.—A steel company has bought upward of 16,000 tons of basic iron at a delivered price of about $19.50, and may buy more to cover a part of its first quarter requirements. Shipments will be begun at the termination of present contracts in December. Otherwise, the pig iron market presents no new features. The demand for foundry iron is light, the largest open inquiry being that of the American Engineering Co., Philadelphia, for 500 tons of No. 2X. The Standard Sanitary Mfg. Co., Pittsburgh, has bought a few thousand tons for its Baltimore plant. The invasion of the eastern Pennsylvania district by Buffalo iron may be checked to some extent by an increase in freight rates to take effect Feb. 1, whereby points having a rate of $4.41 from Buffalo will pay $4.91.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$19.76 to $20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.26 to 20.76
East. Pa. No. 1X	20.76 to 21.26
Basic (delivered eastern Pa.)	19.50 to 20.00
Gray forge	19.50 to 20.00
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.c.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	25.29 to 25.54
Virginia No. 2X, 2.25 to 2.75 sil.	25.79 to 26.04

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Ferromanganese.—No word has come from domestic producers of ferromanganese as to the price for first half, nor have the agents of English furnaces been informed as to what attitude on price their principals will take. Presumably the latter are awaiting the announcement from domestic producers. It is generally expected that there will be an advance.

Plates.—This product has probably benefited less than bars and shapes in the slight increase in business which has followed the advance in price to 1.80c., Pittsburgh. Most of the Eastern mills are operating at a low rate, 50 per cent or less. Some of the smaller buyers have paid 1.80c., but the majority of consumers have been protected to the end of the year at the former price. It does not appear that Eastern mills have had any great measure of success in applying a $2 per ton extra for less-than-carload lots.

Structural Shapes.—Some work which had been pending for some time has been closed as the result of the recent announcement of an advance in price of $1 a ton, but most of this is in small lots. There is a scarcity of prospective building contracts requiring large lots of steel, and some fabricating shops in this district are already in need of tonnage and almost none is in sight. While the 1.80c. quotation has taken effect on some small orders, the real test of the advance will not come until first quarter requirements are put up to the mills.

Bars.—Steel bars were conspicuous among the products which showed larger sales during the past week. On new business 1.80c., Pittsburgh, is firm, but consumers of any importance are covered to the end of the year at 1.75c.

Sheets.—Some of the makers of sheets are certain that the decline in prices has been checked, and that higher prices may be expected soon. This will not be predicted on the condition of mill order books, but upon the need for more remunerative selling prices. Sales during the past week have generally been at 2.75c. and 2.80c. for black, 3.65c. for galvanized and 2.10c. for blue annealed, Pittsburgh base.

Imports.—Pig iron imports last week took a big jump upward, totaling 5938 tons, of which 3012 tons came from England, 2776 tons from India and 150 tons from the Netherlands. Steel imports amounted to 595 tons, of which France shipped 248 tons of shapes and 38 tons of bars; Germany, 51 tons of shapes and 100 tons of bars, and Belgium, 94 tons of shapes and 64 tons of bars. Forty-five hundred tons of manganese ore came from India.

Old Material.—A steel company has bought several lots of heavy melting steel totaling perhaps 15,000 tons at $13.50, delivered. This included one lot of 5000 tons. Another steel company has taken no large lots, but has picked up carloads and 100-ton shipments at $13.25 and $13.50. The top of the market is not above $14, and that represents the figure at which sales were made a few weeks ago, which possibly could not be duplicated at any mill today. The entire market is weak, and no important change is in sight.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00
No. 1 railroad wrought	15.25 to 15.75
Bundled sheets (for steel works)	10.00 to 10.50
Machine shop turnings (for steel works)	10.50 to 11.00
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast borings (for steel works and rolling mill)	11.25
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.50
Stove plate (for steel works)	12.50
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	11.00 to 11.50
Wrought iron and soft steel pipes and tubes (new specifications)	11.50 to 12.00
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00
Steel rails for rolling	15.00 to 15.50
Cast iron carwheels	15.50
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 15.50

Automobile Industry Uses Air to Carry Steel Chips

Steel shavings and chips weighing 40 lb. per cubic foot are suspended and carried away by air as a result of new methods adopted in the automobile industry to reduce costs and speed up production. One large manufacturer of roller bearings has installed a pneumatic conveyor which carries steel shavings and chips from automatic screw machines to a "chip washer" 500 ft. away. This is capable of handling 120,000 lb. during a 10-hr. day. To carry away the steel, more than 500,000 lb. of air is pumped every day through the conveyors.

Before this system was installed the steel shavings and chips were handled by trucks through aisles and passageways. This not only required trucking equipment but a number of men. A big disadvantage was the leaking of oil from the trucks on to the floor, which made it necessary to keep the floor covered with sawdust, to prevent accidents. The oil that dripped through on to the floor was lost, as it could not be reclaimed, while with the pneumatic system the oil is said to be reclaimed.

This conveying system supplements other systems of controlled air used for collecting fine dusts, resulting from grinding and polishing operations, as well as a system of fans and air filters used for ventilation.

During the first 45 weeks of this year, 45,498,277 carloads of revenue freight were reported by the American Railway Association. Except for the 46,233,548 carloads of the corresponding period of 1926, this was the highest total on record, having been more than 1,000,000 ahead of 1925 and more than 1,800,000 ahead of 1923, the previous high marks.

San Francisco

Demand for Steel Is Light—Large Building Permits in Los Angeles

SAN FRANCISCO, Nov. 19 (*By Air Mail*).—Orders and inquiries for finished steel products during the past week showed little improvement over the previous week, and mill representatives are not any too optimistic regarding the outlook for the rest of the year.

Reports from Los Angeles state that November will be the peak month of the year for projected building, as up to Nov. 8 the number of permits issued totaled 1152, with an estimated valuation of $12,845,075. The total for the entire month of November, 1926, was $8,688,255.

Outstanding in a market devoid of large awards was a call for bids for 600 tons of plates for an electric-welded steel pipe line at Ventura, Cal., and an announcement that bids would be taken in the near future for 3000 tons of structural shapes for the Coyote Point bridge across San Francisco Bay.

Pig Iron.—Foundry operations continue on a limited scale, and sales and inquiries during the week were confined to unimportant lots. Approximately 1000 tons of Indian iron arrived on the Coast this week, of which 500 tons is now being unloaded at San Pedro, Cal., the remainder to be delivered in San Francisco next week. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Awards of fabricated structural material this week were confined to small tonnages, ranging from 20 to 70 and 80 tons. No action has yet been taken on the inquiry of the Simpson Logging Co., Seattle, Wash., for two bridges calling for 2100 tons. Bids have been received on 400 tons for an addition to the Medical-Dental Building in San Francisco, and an award is expected to be made within the next 10 days. Plans are being prepared for the Coyote Point bridge across San Francisco Bay, and bids will be called for shortly for 3000 tons of steel. Bids for the reinforcing bars involved, some 8500 tons, have already been taken by the Raymond Concrete Pile Co. Foreign material ranges in price from 1.65½c. to 1.70c., c.i.f., duty paid, while plain domestic shapes continue firm at 2.40c., c.i.f.

Plates.—Only one plate project of importance is up for figures. This is 600 tons for a pipe line at Ventura, Cal., bids on which go in Dec. 5. Alternate bids are also being taken for cast iron pipe. The award for the reconstruction of the Verde pipe line at Phoenix, Ariz., on which alternate bids were taken for cast iron, reinforced concrete and riveted steel pipe, the latter classification calling for 600 to 1000 tons, depending upon whether No. 10 and 12 gage blue annealed sheets of 3/16-in. plates were used, went to the Western Concrete Pipe Co., Los Angeles, who will furnish reinforced concrete pipe. Plate prices continue at 2.40c., c.i.f., on the general run of business.

Bars.—Interest in the bar market this week continues to center in the inquiry for 8500 tons for the Coyote Point bridge across San Francisco Bay, and an announcement of the award is expected next week. The only letting of over 100 tons was secured by the Pacific Coast Steel Co. and called for 210 tons for barracks at Fort Lewis, near Seattle, Wash. Out-of-stock prices are by no means firm in the San Francisco district, and the quotation of 2.75c. to 2.85c. on large lots is rarely held to, an extremely low price having been named on the 1300-ton lot for the Butler Building, San Francisco, placed last week. Because of keen competition for existing business, mill prices range around 2c. and this figure has been shaded a dollar or two a ton on desirable business.

Cast Iron Pipe.—Awards this week were limited to two projects in which over 100 tons were involved. Burbank, Cal., placed 212 tons of 4 and 6-in. Class 250 with the Pacific States Cast Iron Pipe Co. and 32 tons of 8-in. Class 350 with the American Cast Iron Pipe Co. R. H. Downer secured 153 tons of 4 and 6-in. Class B pipe for the improvement of Campo Road for San Diego, Cal. Phoenix, Ariz., has decided upon reinforced concrete pipe for the reconstruction of the Verde pipe line, and the inquiry for 3605 tons of 36-in. Class A pipe has been withdrawn. Bids will be opened on Dec. 5 for 686 tons of 4 to 14-in. Class B pipe for Ventura, Cal. In addition, alternate bids on welded steel and Class B pipe will be taken on 2856 tons of 18, 20 and 24-in. pipe. Santa Ana, Cal., opens bids on Nov. 28 for 491 tons of 4 and 8-in. Class B pipe for the improvement of South Main Street. Prices show a tendency toward a slightly higher level, general quotations being around $36 a ton, delivered, on 6-in. and larger.

Rails.—An announcement of the award of 1150 tons of 60 to 127-lb. T and girder-rails for the municipal railroad at Seattle, Wash., is expected during the coming week. This is the only important tonnage of track material before the trade.

Warehouse Business.—Heavy hardware distributers in this district report improvement in the movement of stocks so far this month over sales for the corresponding period last month. Stocks on hand are by no means large, and the majority of jobbers continue their policy of buying in small lots from time to time. No changes in prices are noted.

Coke.—Quietness prevails in the coke market, pending the arrival of fair sized tonnages from European ports. Present sales and inquiries are for spot material and involve small lots. Prices remain unchanged.

Coke prices per net ton at incoming dock: English beehive coke, $15 to $16.50; English by-product, $12.50 to $13.50.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ¼-in. and over	3.15c.
Small angles, under ¼-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.35c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.35
Cement coated nails, 100-lb. keg	3.35

Birmingham

Pig Iron Bookings Heaviest in Months —Gradual Gain in Steel Demand

BIRMINGHAM, Nov. 22.—Pig iron buying expanded considerably last week, and the furnaces are now provided with a large advance tonnage. After a period of hesitancy, following the reduction to a $16 base, melters have been buying freely, not only for November but for December. Business last week was the best in months. Shipments have grown better, and some of the companies are now shipping in excess of the current make. A large part of production for the rest of the year has already been sold. As a result, furnace companies are in a more comfortable position than for a long time past. Sales on a $16 base are still being confined to November and December. No indication has been given as to first quarter policy.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$16.00
No. 1 foundry, 2.25 to 2.75 sil.	16.50
Basic	16.00

Finished Steel.—Gradual improvement in the market continues. A steady flow of inquiries and orders is coming in. There have been no changes in prices since the advance of $1 per ton on plates, shapes and bars made 10 days ago. The outlook for fabricators and bar manufacturers continues favorable, and their backlogs are growing, mostly as a result of small orders. The Tennessee Coal, Iron & Railroad Co. has reduced open-hearth operations slightly, with an average of 11 furnaces active instead of 12, as for some weeks past. The Gulf States Steel Co. continues to operate five.

Cast Iron Pipe.—Small orders for pressure pipe are more plentiful, and the accumulated tonnage is now of

fair size. Market conditions appear improved, and prices are firmer. A base of $28, Birmingham, is being more uniformly maintained. Several awards are pending. Prospective buyers are feeling out the market, and their tentative inquiries forecast good bookings for the first quarter. Plant operations and shipments are substantially unchanged.

Coke.—The movement of foundry coke has improved somewhat since the reduction of 50c. a ton. The market is still sluggish, and buyers are holding orders close to their requirements. Cold weather came last week, after an unusually long warm spell, and this has materially improved sales and shipments of domestic grades.

Old Material.—Sales have increased slightly. New business last week was above the average of the past several weeks. Buying continues more or less sporadic and uncertain. Prices are low and unchanged. Dealers report a better feeling in the market, but this has not yet reflected in any substantial improvement.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$10.00 to $10.50
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Stove plate	13.00 to 14.00
Steel axles	19.00 to 20.00
Iron axles	18.00 to 20.00
No. 1 railroad wrought	10.00 to 11.00
Rails for rolling	12.00 to 13.00
No. 1 cast	14.50 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

Buffalo

Finished Steel Prices Stronger—Scrap Market Has Better Tone

BUFFALO, Nov. 22.—The pig iron market remains quiet, with no business of consequence pending. One melter is in the market for 100 tons of foundry and 100 tons of malleable, but most inquiries are for carload lots. A great many of the carload lots sought are special analysis irons, so that the actual demand for standard iron is very low. Prices are firm at $17, furnace, for No. 2 plain and $17.50 for malleable.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2X foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	27.28

Finished Steel.—Mill prices on bars and shapes have stiffened, following the general advance in other districts, and are now quotable at 2.065c. per lb., Buffalo. Plates are quoted at 1.965c., Buffalo, with demand low. Bar and shape specifications are fair. Considerable business in bars and shapes was placed just prior to the price increase. In sheets prices are firmer and business is better. Black sheets are now being quoted at 2.90c., base Pittsburgh, galvanized at 3.65c. and automobile body sheets at 4.15c. A Buffalo fabricator has taken the contract for 150 tons of steel for an addition to the building of the Knickerbocker Press at Albany, N. Y., and, in addition, has taken 150 tons of miscellaneous business.

Old Material.—A better feeling is noted, and while no new purchases have been made during the past week, the improved position of the mills leads to the belief that they must require more tonnage very soon. Malleable grades have softened this week, and all three are quotable at $13.50. There is a distinct lack of demand for malleable, which is accentuated through the fact that less is being used throughout the district than in the past. One large mill is taking steady deliveries on old orders of heavy melting steel, and another mill continues to regulate shipments, as it has been doing for over a year. Demand for stove plate and No. 1 machinery cast has disappeared. There has been a big drop in scrap production.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.25 to $14.50
No. 2 heavy melting steel	12.50 to 13.00
Scrap rails	13.25 to 13.75
Hydraulic compressed sheets	11.50 to 12.00
Hand bundled sheets	8.50 to 9.00
Drop forge flashings	11.50 to 12.00
No. 1 busheling	13.00 to 13.25
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.25 to 9.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.50 to 15.75
Railroad coil and leaf springs	16.00 to 16.50
Rolled steel wheels	14.75 to 15.25
Low phosphorus billet and bloom ends	15.75 to 16.00
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	9.75 to 10.00
Cast iron borings	10.00 to 10.50
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	12.00 to 12.50
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	12.75 to 13.00
Locomotive grate bars	10.50 to 11.00
Steel rails, 3 ft. and under	16.00 to 16.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	13.00 to 13.50
Agricultural	13.00 to 13.50
Industrial	13.00 to 13.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	*3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Cincinnati

Southern Furnaces Book Large Tonnage of Pig Iron for First Quarter

CINCINNATI, Nov. 22.—For the first time in many weeks sales of pig iron have attained sizable proportions, and total bookings amount to approximately 20,000 tons. Most of this consists of Southern iron for first quarter delivery at $16, base Birmingham. Southern furnaces decided last week to book first quarter iron at $16, and sales of about 100,000 tons to pipe companies for delivery during January, February and March are reported. With comfortable backlogs, furnaces are considering an advance in prices. The major transactions in this district call for shipment to this city and to other consuming points along the Ohio River, but iron from the South also has penetrated to Hamilton, Dayton and Springfield, Ohio. It has been at least several years since Southern makers have been able to reach these western Ohio cities. Aside from the activity in Alabama and Tennessee iron, the market has been without feature. Lake Erie furnaces have taken small orders on the basis of $16, Cleveland, and southern Ohio producers have sold single carloads at $19, base Ironton. The Seybold Machine Co., Dayton, Ohio, has bought 600 tons of Northern foundry iron, and the Niles Tool Works Co., Hamilton, Ohio, is expected to purchase 500 tons.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	19.63
Alabama fdy., sil. 2.25 to 2.75	20.19
Tennessee fdy., sil. 1.75 to 2.25	19.69
Southern Ohio silvery, 8 per cent	28.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Specifications and orders for heavy steel products have turned upward in the past week, and the present outlook is the most encouraging in many weeks. Most of the business has been placed at the old price of 1.75c., base Pittsburgh, on bars, plates and shapes, with consumers protecting themselves on requirements up to Jan. 1. Bookings have come from widely diversified sources, representing all

of the important consuming industries. Some fabricators are ordering material at a fair rate, although activity in structural steel has dropped off considerably in the past month. The only sizable pending job is a building for the Young Women's Christian Association, Cincinnati, which will take about 500 tons of steel. Buyers in general are not objecting strenuously to the advance of $1 a ton on plates, shapes and bars, and in many cases express the hope that the mills will be able to stabilize the market at the new schedule. In wire goods prices are trending toward weakness, particularly at points along the Ohio River. One producer is reported to be selling common wire nails at $2.59 per keg, delivered on the river bank at this city. Under this arrangement customers must pay haulage charges from the river to warehouses. This price is equivalent to $2.45 at mill, plus a 14c. barge rate to Cincinnati. Local jobbers will receive a bargeload of nails from Ironton, Ohio, during the coming week. Sheet bookings have been in good volume, but prices show no improvement. Galvanized sheets are selling at 3.65c. to 3.75c., base Pittsburgh, with still lower prices being made in the South. Sales of blue annealed have been made at 2.10c. to 2.15c., and black sheets range from 2.80c. to 2.90c., base Pittsburgh.

Reinforcing Bars.—The E. H. Latham Co., Columbus, Ohio, has been awarded the general contract for a new municipal sewage disposal plant at Dayton, Ohio, a job which will require about 1400 tons of bars. The William Harig Co., Cincinnati, is expected to buy 250 tons for a high school for the Sisters of the Precious Blood in this city, while the Hodges Construction Co., Cincinnati, will purchase 100 tons for a new building at the Cincinnati Tuberculosis Hospital. Bids are now being taken on 150 tons for the local Young Women's Christian Association's new home. New billet bars are selling at 1.80c., base Pittsburgh, an advance of $1 a ton from previous quotations. Rail steel stock continues at 1.70c., base mill.

Warehouse Business.—There has been a further recession in sales during the past week, and total bookings have been surprisingly light. The dullness has affected all products. Announcement has been made of a new list of extras on hot-rolled hexagons which represents a decrease from the present schedule. The change is effective immediately. Otherwise quotations are firm and unchanged.

Coke.—The movement of by-product foundry coke in the past week has been light, and indications are that shipments this month will be considerably smaller than in October. Domestic grades are in the midst of a slump, which is partially attributable to mild weather. By-product coke companies have about closed their annual campaign to sign up customers to ontrats for 1928, the price to be set at the beginning of each month. Demand for New River and Wise County beehive coke is lagging, but quotations have not changed.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Heavy melting steel has declined 25c. a ton and is now quoted at $10.75 to $11.25. The Portsmouth, Ohio, works of the Wheeling Steel Corporation is reported to have purchased a round tonnage of melting steel at a delivered price of $14. Railroads are understood to have received from 50c. to 75c. a ton less for their material this month than last. Consumers are manifesting little interest in forward buying, and therefore sales by dealers have been small.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$10.75 to $11.25
Scrap rails for melting	11.50 to 12.00
Loose sheet clippings	8.50 to 9.00
Bundled sheets	9.50 to 10.00
Cast iron borings	8.50 to 9.00
Machine shop turnings	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 1 railroad wrought	11.00 to 11.50
Short rails	17.00 to 17.50
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	16.00 to 17.00
No. 1 railroad cast	13.50 to 14.00
Burnt cast	8.00 to 8.50
Stove plate	9.25 to 9.75
Brake shoes	10.00 to 10.75
Railroad malleable	12.50 to 13.00
Agricultural malleable	12.00 to 12.50

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

St. Louis

Steel Specifications in Good Volume —Pig Iron Buying Tapers

ST. LOUIS, Nov. 22.—Sales of pig iron during the last week showed a marked falling off as compared with the preceding week. Orders of the Granite City maker totaled only about 2000 tons, which was distributed throughout the territory it serves. The most important inquiry before the market is for 5000 tons for the Louisville, Ky., plant of the Standard Sanitary Mfg. Co. It is expected that a greater tonnage will be purchased than the inquiry calls for. Generally, however, melters are still content to buy only for immediate needs and to let the future take care of itself. Prices are unchanged.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	20.66
Southern No. 2 fdy., delivered	20.42
Northern malleable, delivered	20.66
Northern basic, delivered	20.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Cooler weather has brought forth a greater demand for domestic grades of coke, enabling ovens and dealers to reduce stocks. Buying of foundry coke is only fair. Prices are unchanged.

Finished Steel.—Buying of plates, shapes and bars for immediate shipment is light, although specifications against contracts have been most satisfactory to the mills. Some consumers have offered business to mills for first quarter shipment on the basis of today's prices, but these orders have not been accepted. Demand for sheets is light, and there are complaints of price cutting to get the business that is available. Structural fabricators are getting only a few small jobs, and the only local building project in sight is the Savoy Plaza Hotel, 1100 tons, which also will require 600 tons of reinforcing bars.

Old Material.—The scrap market continues weak.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, $\frac{7}{8}$-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped	60
Hot-pressed nuts, hexagons, blank or tapped	60

Prices are unchanged for the reason that no sales have been made. Dealers believe that there will be a better demand for nearly every grade after Jan. 1, but they expect no radical price advances. Railroad lists during the week were light, including the Chicago & Alton and the Mobile & Ohio, 1200 tons each; Chicago, Milwaukee & St. Paul, 750 tons, and the Cotton Belt and the Missouri Pacific, 500 tons each.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$10.75 to $11.00
No. 1 locomotive tires	13.00 to 13.50
Heavy shoveling steel	10.75 to 11.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	12.75 to 13.00
Railroad springs	12.75 to 13.00
Bundled sheets	8.00 to 8.50
No. 2 railroad wrought	10.75 to 11.00
No. 1 busheling	9.50 to 10.00
Cast iron borings	8.75 to 9.00
Iron rails	12.50 to 13.00
Rails for rolling	13.50 to 14.00
Machine shop turnings	6.00 to 6.50
Steel car axles	18.25 to 18.75
Iron car axles	22.50 to 23.00
Wrought iron bars and transoms	19.50 to 20.00
No. 1 railroad wrought	10.00 to 10.50
Steel rails, less than 3 ft	14.50 to 15.00
Steel angle bars	10.75 to 11.25
Cast iron carwheels	12.00 to 12.50
No. 1 machinery cast	14.50 to 15.00
Railroad malleable	11.00 to 11.50
No. 1 railroad cast	13.00 to 13.50
Agricultural malleable	11.50 to 12.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Canada

Steel Works Operations Improve—Pig Iron and Scrap Markets Dull

TORONTO, ONT., Nov. 22.—The general trend of business and industrial plant operations in Canada is on the upgrade. While there is nothing sensational in the way new orders are coming in, the flow is steady, and a number of industrial companies, especially those engaged in the iron and steel industry, report a much better volume of orders on their books today than was the case a year ago. This year's wheat crop will be the second largest on record, and the opinion of industrial leaders doing business in the Canadian West is that the situation is the best in years.

Operations at the Sydney, N. S., steel mills of Dominion Iron & Steel Co. (British Empire Steel Corporation), started up Nov. 14, are expected to continue on a full time basis, with 2600 men employed, throughout the winter. The rail mill was put on full shift to take care of accumulated orders and all the open-hearth furnaces were put in operation to supply the necessary steel. A second blast furnace was also blown in to take care of the basic iron needs.

The rail mill of the Algoma Steel Corporation, Sault Ste. Marie, Ont., which was shut down during August, resumed operations on single shift Nov. 14, and is now running on a rail order for the Canadian Pacific Railway. Open-hearth furnaces and a blast furnace were also started up to supply the necessary steel. The Algoma Steel Corporation has, in addition to the rail contract for the Canadian Pacific Railway, an order for 50,000 tons of rails for the Canadian National Railways, as well as a number of other rail orders, which will bring its total up to approximately 100,000 tons. The company has also a number of orders on hand for various other lines of material, which, with those in prospect for early closing, assure present close to capacity operations until next April at least.

The Steel Co. of Canada, Ltd., Hamilton, Ont., has been more fortunate than other Canadian mills with regard to new business this year. Since the latter part of 1926 the company's plant at Hamilton has been running practically at capacity in all departments, and from the standpoint of production has experienced one of the best years since the close of the war.

In addition to the better market conditions in Canada for products of the iron and steel industry, there has been a stronger demand on export account, and markets have been found in countries where it was almost impossible to sell in former years. British Dominions, such as South Africa, India, Australia, New Zealand and the British West Indies, are now proving much better customers for the products of Canadian industrial enterprise, especially in the iron and steel lines.

Pig Iron.—Sales in the Canadian markets are beginning to diminish. Advance buying has practically disappeared, although those covered by contract until the end of the year are specifying and shipments are going forward on schedule. Current demand is almost entirely for spot delivery, and sales on this account also show a falling off in tonnage. Foundry and malleable iron sales for the week ranged from one to two cars, with an odd lot up to as much as 200 tons. The importation of pig iron by agricultural interests continues at a high level, while at the same time competition on the part of United States producers for other Canadian business is fairly active, especially in the Montreal district. Pig iron imports from England and the Continent are on the decline, but most warehouses carrying imported iron of this kind are fairly well stocked. Price shading continues a feature in the Montreal market, although Toronto prices have not been affected.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	25.50
No. 2 foundry, sil. 1.75 to 2.25	25.50
Malleable	25.50
Basic	24.50
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—Interest on the part of consumers has disappeared, and business has reverted to a state of stagnation. Consumers covered by contract are placing orders against these, which in themselves are responsible for a fair movement of scrap. New business either for spot or advance delivery, however, is light. Export demand has also fallen off during the past month. Prices are showing a weaker undertone, and while no changes have been made during the week, local dealers look for a decline to lower levels within the next few days.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.50	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	10.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

Boston

More Interest Shown in 1928 Pig Iron —Large Fabricating Jobs in Sight

BOSTON, Nov. 22.—Sales made by the Mystic Iron Works in the past week totaled 2800 tons, including No. 2 plain, No. 2X and No. 1X. Prices ranged from $19 to $21 a ton, furnace, depending on freight rates and silicon. Among the individual lots was one of 500 tons of No. 2X and several of 50 to 300 tons, with 75 per cent of the total tonnage for delivery this year. The Mystic stack reports an awakening of interest in 1928 iron and prospects of early bookings. Representatives of other furnaces find business quiet and confined to car lots, with no open inquiries of importance. In recent sales charcoal iron brought $24 a ton, base Michigan furnace, and eastern New York State iron, $18.50 and $19, furnace, for No. 2X and No. 1X respectively. Although the Champlain stack has disposed of its surplus stocks, when it will be blown in is still problematical. The Hudson Valley stack is reported to have shipped all its No. 1X iron. Buffalo iron now seems pegged at $17 a ton, furnace, for No. 2 plain.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$21.41 to $21.91
Buffalo, sil. 2.25 to 2.75	21.91 to 22.41
East. Penn., sil. 1.75 to 2.25	22.65 to 23.15
East. Penn., sil. 2.25 to 2.75	23.15 to 23.65
Virginia, sil. 1.75 to 2.25	25.96 to 26.21
Virginia, sil. 2.25 to 2.75	26.46 to 26.71
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Imports.—Imports of pig iron at Boston during the first half of November were smaller than in any similar period since April. The total for the period was 499 tons, made up of 300 tons of Dutch iron and 199 tons of Indian. In the first half of October, this year, imports totaled 1384 tons, and in the first half of November, last year, 2110 tons.

Coke.—In the closing days of this week the New England Coal & Coke Co. and the Providence Gas Co. will open their books for foundry coke contracts for the first half of 1928. Anticipating this announcement, local brokers have signed up many foundries and it is estimated that fully 50 per cent of the usual contracts will be presented to the ovens on the opening day. Both companies are doing business on a basis of $12 a ton, delivered, within a $3.10 freight rate zone. Shipments of fuel continue to run ahead of those for last month and are about on a par with those for November, 1926.

Shapes and Plates.—An announcement by the Boston & Maine Railroad of its intention to build a new terminal station, auditorium and hotel to cost around $7,000,000, and the proposal of the mayor of Boston to erect a municipal stadium and auditorium to cost $30,000,000, together with several new bridges, theaters, warehouses and other prospective jobs have enlivened the market for shapes and plates, although actual bookings by fabricators remain small. Fabricators in general believe that the advance in mill prices on shapes, plates and bars will hasten the closing of contracts that have been hanging over the market for some time. It is said that New England railroads will not build permanent bridges to replace those recently destroyed by floods until next spring.

Cast Iron Pipe.—One of the largest Massachusetts gas companies has placed an order for 4000 tons of gas pipe for its requirements in the first half of 1928. Several other utility companies are sounding out the market for round tonnages needed in 1928. Providence, R. I., closed bids yesterday on 1000 tons of 4-in. to 12-in. pipe and will make an award this week. Portland, Me., is in the market for 300 tons of 8-in. pipe. Newton, Mass., has placed a round tonnage of 6-in. pipe with the Warren Foundry & Pipe Co. No other municipalities are asking for open bids on material, but several are negotiating privately with foundries.

Old Material.—Buying of old material has again dropped to small proportions, and the market looks softer, although few actual price reductions have taken place. One of the most active local brokers, who heretofore has paid $5.65 a ton, on cars, for long bundled skeleton, has dropped his price to $5.10, but that does not affect the average range of quotations for such material. Most of the few cars of heavy melting steel reported sold in the past week went at, or close to, $8.60 a ton, on cars. Free offerings of chemical borings at $10.10 a ton, on cars, have failed to bring out buyers. A Massachusetts brakeshoe plant has filled its stove plate requirements at $10.50 to $11 a ton, delivered, and has withdrawn from the market. Demand from New England foundries for No. 1 machinery cast and textile cast at $15.50 a ton, delivered, is slightly more active.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.50 to $9.00
Scrap rails	8.50 to 8.75
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	8.50 to 9.00
Machine shop turnings	5.50 to 6.00
Cast iron borings (steel works and rolling mill)	6.00 to 6.50
Bundled skeleton, long	5.00 to 5.60
Forge flashings	5.50 to 6.00
Blast furnace borings and turnings	5.50 to 6.00
Forge scrap	5.75 to 6.00
Shafting	13.00 to 13.50
Street car axles	16.50 to 17.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.50 to 8.00
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	10.00 to 10.50
Prices per gross ton delivered consumers' yards:	
Textile cast	$15.00 to $15.50
No. 1 machinery cast	15.00 to 15.50
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Railroad malleable	13.50 to 14.00

Detroit

Advance in Shapes Drives in Fabricating Orders—Alloy Steel Weaker

DETROIT, Nov. 22.—The effect of the recent advance in the mill price of structural steel has been to release a number of small lot orders for fabricated steel, giving small shops much needed tonnage. The only sizable steel jobs in prospect locally at present are an office building and a body storage building for the Chrysler Corporation, and a garage in connection with the Book Building.

The Ford Motor Co., with a payroll of $44,000 at the River Rouge plant and $20,000 at the Highland Park plant, is adding about 100 men per day.

In alloy steel bars moderate orders have been placed by the Hudson and Chrysler companies for January and February deliveries, and the Chevrolet company will probably be in the market for early 1928 delivery within the next 10 days. Quotations on 3½ per cent nickel, S. A. E. No. 2300, range from $4 to $4.10 per 100 lb.; nickel chromium, S. A. E. No. 3100, is bringing $3 to $3.10, and chrome vanadium, S. A. E. No. 6100, $4 to $4.15.

Hot-rolled strip is still very much unsettled, with the larger widths and heavier gages quoted at 1.90c., Pittsburgh. Blue annealed sheets, also irregular, are being bought at 2c., base Pittsburgh. Automobile body sheets remain at 4.15c., Pittsburgh, and cold-finished bars, at 2.10c.

Old Material.—With the imminent closing of navigation, there is a possibility that the scrap market in this district will show some further weakness, owing to the fact that sufficient tonnage is being moved by water to carry the mills over the remainder of the year and this outlet will be closed. Several of the largest producers of automobiles anticipate increasing their schedules toward the end of the year, but at present production is on the lowest basis of the last 12 months.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$11.75 to $12.25
Borings and short turnings	8.50 to 9.00
Long turnings	7.50 to 8.00
No. 1 machinery cast	16.00 to 17.00
Automobile cast	18.00 to 19.00
Hydraulic compressed sheets	10.00 to 10.50
Stove plate	11.50 to 12.50
No. 1 busheling	9.00 to 9.50
Sheet clippings	7.50 to 8.00
Flashings	9.75 to 10.25

Pacific Northwest

Considerable Structural Work in Sight —Ocean Rates on Steel Shaded

SEATTLE, Nov. 19 (*By Air Mail*).—The local steel market seems to have settled down to a condition in which consumers and jobbers are buying only tonnage that is actually needed, and this situation is likely to last, and perhaps will become more intensified, until after the first of the year. This means that there is more competition to secure what little business is being placed, with the result that prices are not any too strong. On any really desirable tonnage what are regarded as ruling market quotations are subject to shading.

Water rates on steel from Eastern mills to the Coast are being slightly shaded in some cases by the smaller lines, as low as 25c. per 100 lb. having been named, it is said, as against 35c., the rate of the conference lines. It is reported that as much as 85 per cent of the steel tonnage being shipped to the Coast is coming on the lines of the Bethlehem Steel Corporation and the United States Steel Corporation.

Pig Iron.—There is virtually no activity in the local market outside of the purchase of a few small lots from the Utah maker. Utah No. 2 foundry and basic continue to bring $24 to $25 per gross ton, delivered Seattle.

Structural Material.—While very little new work is being placed, a large amount is in sight and some of it is expected to come out very early in the new year. The steel for the Port Townsend and Aberdeen, Wash., pulp and paper mills to be built by Zellerbach Paper Co., San Francisco, 800 to 1000 tons, has been taken by the San Francisco office of the McClintic-Marshall Co. It has been definitely decided that the new building of the Northern Life Insurance Co., to be built on Third Avenue in this city, will be constructed of fabricated steel, and bids will be asked in a week or two, the amount of steel being estimated at 2000 to 2200 tons. The award of 2700 tons for two bridges for the Simpson Logging Co., Seattle, one over Vance Creek and the other over the Skohomish River, will probably be placed next week. Other work in sight includes 1000 tons for the Paramount Theater at Spokane, Wash., and the Oregon-Washington viaduct to be built in Seattle, 640 tons. Bids have gone in on both these jobs. Shapes continue to be quoted at 2.40c., c.i.f. Seattle, but on very desirable tonnage this price has been shaded.

Steel Bars.—The local market is quiet on both merchant and reinforcing bars, and only a fair amount of work is in sight. A new building for the Bon Marche department store is to be reinforced concrete, and bids on 2000 to 2200 tons of bars are to be asked early in the new year. Orders placed in the past week totaled only about 300 tons. Reinforcing bars range in price from 1.90c. to 2.25c., depending on size and desirability of the order. Merchant steel bars are quiet at about 2.35c., c.i.f. Seattle.

Track Supplies.—The city of Seattle is in the market for 1150 tons of standard-section 110-lb. rails for delivery in the new year. Bids will be asked in a few days.

Plates.—The market is extremely quiet, and no large work is in sight. The city of Seattle is expected to buy considerable steel pipe next year to replace wooden water lines that have been in service many years and are about worn out. Plates are quoted at 2.40c., c.i.f. Seattle, for small orders, but this would probably be shaded on attractive tonnage.

Warehouse Prices, f.o.b. Seattle

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Reinforcing steel bars	2.75c.
Blue annealed sheets No. 10	3.90c.
Black sheets (No. 24)	4.85c.
Galvanized sheets (No. 24)	5.65c.
Rivets, button and cone head	5.00c. base
Rivets, tank	50 per cent off list
Common wire nails, base per keg	$3.05
Cement coated nails, 100-lb. kegs	3.10

Steel Pipe.—The city of Seattle is in the market for 30,000 ft. of ¾ and 1-in. galvanized steel pipe for its water department, and the city of Tacoma, Wash., for 60,000 ft. of 1-in., 2-in. and 3-in. galvanized steel pipe for the same purpose.

Census of Non-Ferrous Industries Reflects Greater Use of Aluminum

Results of the 1925 census of manufactures for the non-ferrous industries have just been issued. A total of 1044 establishments employing 62,942 wage earners are engaged in making brass, bronze and other copper plates, rods, bars, tubing, pipe and castings. The value of the product was $519,725,195, of which 35 per cent was added during manufacture. Electric fixtures, hardware and plumbers' supplies not included in this total, but produced incidentally to other major operations, are valued at $95,128,120. Leading States are Connecticut, employing 20,415 men, New York with 10,861, and Michigan with 8258.

One important branch of the industry not included in the above is engaged in smelting scrap, dross, and various wastes. Whereas only 41 such establishments employing 1587 men were engaged in this work in 1923, in 1925 there were 102 establishments and 2944 men. The total value of their products was $82,137,523. Illinois and Pennsylvania are leaders in such work. This classification does not include precious metals or smelting from ore, but does include recovery of scrap aluminum.

Data on the various products follow:

Products for remanufacture	Pounds	Value
Ingots:		
Brass	171,712,655	$19,940,064
Bronze	27,173,663	3,646,356
White metal (aluminum)	127,276,358	14,128,076
Plates and Sheets:		
Brass	348,819,685	63,633,137
Bronze	31,152,389	7,291,658
Copper	162,315,804	35,231,493
Rods and Bars:		
Brass	156,593,023	25,373,678
Copper	226,948,057	36,485,503
Seamless Tubing:		
Brass	96,517,764	23,100,772
Copper	57,954,140	14,909,482
Castings:		
Brass	.....	36,242,597
Bronze	.....	43,628,966
Bearings and bushings	.....	21,184,034
Die castings	.....	20,116,492
Extruded shapes	.....	1,808,667

Copper wire is not included in the above, but is a part of the "Wire" industry, which produced in 1925 614,156,947 lb. of non-ferrous wire valued at $111,417,565. Likewise the value of bronze castings noted above, being greater than brass castings, reflects the fact that castings for electric fixtures, hardware and plumbers' supplies are excluded from the tabulation.

Sixty-seven plants employing 1465 workmen are engaged primarily in the manufacture of babbitt metal, white metal, type metal and solder, a sharp drop from the 118 firms so occupied in 1919. Production is valued at $50,650,498 (of which 13 per cent is added during manufacture), and include the bulk of the following items:

	Pounds	Value
Babbitt and bearing metal, ingots	97,756,585	$21,817,354
Solders	85,448,515	25,685,262
Type metal	60,103,061	6,517,359

Lead, bar, pipe, and sheet is the principal product of 29 firms, employing 728 workmen, and making material valued at $23,179,847. This is principally block lead, bars, and sheets, lead pipe and lead traps and bends. Details follow:

	Pounds	Value
Lead plates and sheets	51,183,053	$5,681,165
Lead rods and bars	7,810,185	772,742
Lead pipe	105,776,216	11,859,902

The aluminum industry is engaged in the manufacture of plates, sheets, castings and utensils, but not in the manufacture of ingots, either from the ore or from scrap. This is a rapidly growing industry, as noted in the following tabulation.

Year	Plants	Workmen	Value of Products
1914	37	4,614	$19,597,465
1919	83	11,402	75,277,948
1923	119	16,288	106,930,367
1925	127	14,353	127,830,756

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Nov. 22	Nov. 21	Nov. 19	Nov. 18	Nov. 17	Nov. 16
Lake copper, N. Y.	13.75	13.75	13.75	13.75	13.75	13.75
Electrolytic copper, N. Y.*	13.50	13.50	13.50	13.50	13.50	13.50
Straits tin, spot, N. Y.	58.12½	58.37½	....	57.75	57.25	57.12½
Lead, New York	6.25	6.25	6.25	6.25	6.25	6.25
Lead, St. Louis	6.05	6.05	6.05	6.00	6.00	6.00
Zinc, New York	6.17½	6.17½	6.15	6.10	6.07½	6.05
Zinc, St. Louis	5.82½	5.82½	5.80	5.75	5.72½	5.70

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Nov. 22.—All the markets are considerably stronger and more active. Copper prices have again gone higher and tin has advanced appreciably. Quotations for lead have strengthened somewhat and zinc prices have reversed themselves quite decidedly from the low point last week.

Copper.—Further advances in prices are a feature of the market, both for domestic and foreign consumption. Two increases in the quotation of Copper Exporters, Inc., have been made in the last week, the first on Nov. 16 from 13.80c. to 13.95c., and the second yesterday, Nov. 21, from 13.95c. to 14.05c., all c.i.f. Hamburg. Despite these advances, buying from Germany, particularly, and from England, France and other countries has continued unabated, constituting the main strength of the market. There have also been two increases in domestic quotations, each of ⅛c. per lb., bringing the price of electrolytic copper to 13.75c., delivered in the Connecticut Valley. The latter price was reached as early as Saturday, Nov. 19, with the 13.62½c. quotation established as early as Thursday, Nov. 17. There has been some buying as the advance has progressed, but it has not been particularly heavy for domestic consumption. Some companies have sold only for December shipment, while others have made sales into January-February. Lake copper is quoted at 13.75c., delivered.

Tin.—Sales of 1700 to 1800 tons, including 200 tons on Saturday, is the record for the week. Consumers bought substantial quantities, but the bulk was taken by dealers. Several days were quiet, with the others very active. Short sales were reduced by covering, the bears turning to bulls. A strong sentiment in favor of tin the past week or so has developed. Yesterday, Monday, 400 tons changed hands, consumers buying January-February delivery and showing more interest. Only once in a very long while is tin exported from New York to London. On Nov. 12, 55 tons of Straits tin was exported to London, the New York market being sufficiently below that of London to warrant the shipment. A little more metal may be thus disposed of, but the abnormal situation will soon right itself. Yesterday spot Straits tin sold in London at an equivalent of 59.75c., New York, with the corresponding New York price 58.25c. Allowing for all expenses, tin could be exported to London at a profit of about $15 a ton. Prices in London today were considerably higher than a week ago, with spot standard quoted at £267, future standard at £264 and spot Straits at £274 10s. The Singapore price today was £268 5s. The market here today was moderately active, with spot Straits tin quoted at 58.12½c., New York. Arrivals thus far this month have been 3675 tons, with 3775 tons reported afloat.

Lead.—Prices are somewhat higher in the outside market, with lead selling at 6.05c., St. Louis, or 6.30c., New York. The leading interest, however, still maintains its contract price at 6.25c., New York. Inquiry is reported better and there has been some substantial buying for November and December.

Zinc.—By some the worst is believed to have been passed, and during the week prices have gradually risen from the low point of 5.60c. a week ago to 5.82½c., St. Louis, today, for prime Western zinc for November-December delivery. There is now a slight premium for futures. Dealers have been quite active on the advance, but buying by consumers has not been particularly heavy. While there has been some improvement in the steel market as a whole, it has not yet appeared in galvanized products. Ore prices last week advanced $1 a ton to $36, Joplin. Production for the week was still

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	60.50c. to 61.50c.
Tin, bar	62.50c. to 63.50c.
Copper, Lake	15.00c.
Copper, electrolytic	14.75c.
Copper, casting	14.00c.
Zinc, slab	7.37½c. to 8.37½c.
Lead, American pig	7.50c. to 8.50c.
Lead, bar	9.75c. to 10.75c.
Antimony, Asiatic	12.75c. to 13.25c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	39.25c. to 40.25c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	63.50c.
Tin, bar	65.50c.
Copper, Lake	14.50c.
Copper, electrolytic	14.50c.
Copper, casting	14.00c.
Zinc, slab	7.75c.
Lead, American pig	7.00c.
Antimony, Asiatic	16.00c.
Lead, bar	9.25c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	66.75c.
Solder, ½ and ½	37.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.50c. to 19.25c.
Copper, hot rolled	22.25c. to 23.25c.
Copper, cold rolled, 14 oz. and heavier,	24.50c. to 25.50c.
Seamless Tubes—	
Brass	23.37½c. to 24.37½c.
Copper	24.25c. to 25.25c.
Brazed Brass Tubes	26.50c. to 27.50c.
Brass Rods	16.25c. to 17.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on all brass and copper products except copper wire were advanced ¼c. on Nov. 21. There has been no change on lead full sheets or zinc sheets since the advances of Oct. 5 and Aug. 5 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.50c.
Copper, hot rolled	22.50c.
Zinc	10.00c.
Lead (full sheets)	9.75c. to 10.00c.
Seamless Tubes—	
High brass	23.37½c.
Copper	24.25c.
Rods—	
High brass	16.25c.
Naval brass	19.00c.
Wire—	
Copper	15.50c.
High brass	19.00c.
Copper in Rolls	21.50c.
Brazed Brass Tubing	26.50c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	19.50c.
Copper, hot rolled	22.50c.
Copper, cold rolled, 14 oz. and heavier	24.75c.
Zinc	11.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	24.87½c.
Copper	25.75c.
Brazed Brass Tubes	26.50c.
Brass Rods	16.25c.

high or close to 15,000 tons, but sales had increased, and it is believed stocks are in strong hands.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Antimony.—The market is firm and Chinese metal is quoted at 10.87½c., duty paid, New York, for all positions.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 25c. per lb., delivered.

Non-Ferrous Metals at Chicago

Nov. 22.—Sales in this market are more numerous, especially in copper. Purchasers usually ask for prompt delivery and show little interest in requirements after the turn of the year. The old metal market is without feature.

Prices, per lb., in carload lots: Lake copper, 13.75c.; tin, 59.50c.; lead, 6.20c.; zinc, 5.85c.; in less-than-carload lots, antimony, 12c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 13c.; all being dealers' prices for less-than-carload lots.

RAILROAD EQUIPMENT

Sante Fe in the Market for 3850 Freight Cars of Various Types

The Santa Fe Railroad is inquiring for 3850 freight and 76 passenger cars, enumerated in detail below. The small volume of railroad equipment business lately was emphasized in the report of the Bureau of Railway Economics at the annual fall meeting of the American Railway Association in New York Nov. 17. This report showed that Class I railroads in the first nine months this year made total capital expenditures for new equipment and additions and betterment to property used in connection with transportation service amounting to $570,215,000, a decrease of $58,878,000 compared with the corresponding period of 1925 and the lowest for any corresponding period since 1923. The total for 1927 will probably be about $750,000,000 or 15 per cent under those of 1926.

Details of the week's business follow:

The Brooklyn-Manhattan Transit Co. has ordered 50 units of triplex articulated cars, consisting of 150 bodies and 200 trucks, from the Pressed Steel Car Co.

The Santa Fe will buy 76 passenger cars, 1000 box cars, 500 refrigerator cars, 300 flat cars, 500 gondola cars, 500 automobile cars, 500 single deck stock cars, 250 double deck stock cars, 100 ballast cars, 100 cabooses and 100 air dump cars.

"Synchronous Motors for Driving Steel Rolling Mills" is the title of a paper to be read on Nov. 29 before the American Institute of Electrical Engineers, at New York, by W. T. Berkshire and H. A. Winne of the General Electric Co., Schenectady, N. Y.

The International Machine Wire Cartel, which includes Germany, France, Belgium, Luxemburg and the Saar has established annual production quotas, according to a report to the Department of Commerce. The allotments are: Germany 1,000,000 metric tons, France, 400,000 tons, Belgium 280,000 tons, and Luxemburg 120,000 tons, a total of 1,800,000 tons. The Saar district quota was included in the allotments of Germany and France.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.50c.	13.00c.
Copper, heavy and wire	11.25c.	12.50c.
Copper, light and bottoms	9.50c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.75c.	7.25c.
Heavy machine composition	9.00c.	10.25c.
No. 1 yellow brass turnings	7.75c.	8.25c.
No. 1 red brass or composition turnings	8.50c.	9.50c.
Lead, heavy	5.125c.	5.375c.
Lead, tea	4.25c.	4.75c.
Zinc	3.75c.	4.25c.
Sheet aluminum	13.00c.	15.00c.
Cast aluminum	12.75c.	14.75c.

REINFORCING STEEL

Awards of About 4700 Tons Include 1000 Tons for Building in Boston

The week's awards of reinforcing steel totaled about 4700 tons, of which 1000 tons is for a building in Boston. Included in 4100 tons of new projects on which bids are invited is 2000 to 3000 tons for a department store in Seattle. Awards follow:

BOSTON, 1000 tons, Pierce Building, on Broad Street, to E. A. Tucker Co.

BOSTON, 500 tons, Great Atlantic & Pacific Tea Co. warehouse, to Kalman Steel Co.

ROCHESTER, N. Y., 250 tons, Masonic Temple, to Truscon Steel Co.

OSWEGO, N. Y., 150 tons, grade school, to General Fireproofing Co.

UTICA, N. Y., 125 tons, Masonic Temple, to Truscon Steel Co.

NEWELL, PA., 100 tons, Pittsburgh & Lake Erie Y. M. C. A. building, to Truscon Steel Co.

CLEVELAND, 700 tons, Central Avenue viaduct work for Cleveland Union Terminals Co., to Bourne-Fuller Co.

ALLIANCE, OHIO, 275 tons, sewage disposal plant, to Bourne-Fuller Co.

OAK PARK, ILL., 200 tons, field house, to Concrete Engineering Co.

CHICAGO, 700 tons of rail steel bars for Shedd Aquarium, to Calumet Steel Co.

STATE OF ILLINOIS, 150 tons of rail steel, State Highway bridge, to Calumet Steel Co.

ST. LOUIS, 200 tons, coagulant house for the municipal waterworks, to Missouri Rolling Mill Corporation.

WEBSTER GROVES, MO., 125 tons, Webster College, to Missouri Rolling Mill Corporation.

SEATTLE, WASH., 210 tons, barracks at Fort Lewis, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 500 tons, post office garage.

NEW YORK, 250 tons, Chevrolet garage and service station at Eleventh Avenue and Fifty-sixth Street; Albert Kahn, Detroit, architect.

DAYTON, OHIO, 1400 tons, sewage disposal plant; general contract to E. H. Latham Co., Columbus, Ohio.

CINCINNATI, 100 tons, Cincinnati Tuberculosis Hospital; general contract to Hodges Construction Co., Cincinnati.

CINCINNATI, 250 tons, high school for Sisters of the Precious Blood; general contract to William Harig Co., Cincinnati.

CINCINNATI, 150 tons, building for Young Women's Christian Association.

CHICAGO, tonnage being estimated, building for the Campbell Soup Co.; Battey & Kipp, engineers.

ST. LOUIS, 600 tons, Savoy Plaza Hotel at Twelfth and Pine Streets.

SEATTLE, WASH., 2000 to 3000 tons, Bon Marché department store; bids to be asked early next year.

FABRICATED STRUCTURAL STEEL

Awards of 14,000 Tons and New Projects Total Nearly 28,000 Tons

Only 14,000 tons of structural steel is reported to have been awarded during the week, and no tonnages of outstanding size. Added to pending projects is about 28,000 tons, including 7000 tons for subway work in New York. Awards follow:

HERSHEY, PA., 200 tons, building for Hershey Chocolate Co., to Belmont Iron Works.

FORT WAYNE, IND., 450 tons, building for International Harvester Co., to Rochester Bridge Co., Rochester, Ind.

CHICAGO, 2500 tons, store and shop building, to an unnamed bidder.

NEW YORK, CHICAGO & ST. LOUIS RAILROAD, 500 tons, bridge in Cleveland, to Fort Pitt Bridge Works.

BOSTON, 350 tons, Pierce Building, on Broad Street, to New England Structural Co.

BOSTON, 100 tons, United Drug Co. warehouse, to E. A. Simpson.

WALPOLE, MASS., 120 tons, high school, to New England Structural Co.

NEW YORK, 1000 tons, apartment building at 1231 Park Avenue, to Harris Structural Steel Co.

NEW YORK, 700 tons, business building on West Forty-fifth Street, to Harris Structural Steel Co.

STATE OF NEW YORK, 250 tons, highway bridge, to Phoenix Bridge Co.

MIDDLETOWN, N. Y., 175 tons, high school building, to a local fabricator.

ALBANY, N. Y., 150 tons, addition to building of Knickerbocker Press, to Kellogg Structural Steel Co.

PHILADELPHIA, 150 tons, transmission towers for the Philadelphia Electric Co., to Belmont Iron Works.

PITTSBURGH, 500 tons, Iron City Electric Co. building, to McClintic-Marshall Co.

PITTSBURGH, 175 tons, H. J. Heinz warehouse extension, to McClintic-Marshall Co.

CLEVELAND, 1300 tons, Eagle Avenue lift bridge for Cleveland Union Terminals Co., to Mount Vernon Bridge Co.

CHICAGO, 260 tons, building for Advance Pattern & Foundry Co., to Gage Structural Steel Co., local.

CHICAGO, 1100 tons, Young Women's Christian Association Building, to American Bridge Co.

CHICAGO, 1500 tons, bascule bridge at Crawford Avenue, to American Bridge Co.

PARK RIDGE, ILL., 390 tons, theater, to Gage Structural Steel Co.

WEST TEXAS, 1200 tons of plates for Gulf Refining Co., to Chicago Bridge & Iron Co.

PORT TOWNSEND AND ABERDEEN, WASH., 800 to 1000 tons, paper mills for Zellerbach Paper Co., to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

WASHINGTON, 300 tons, building for American Red Cross.

KNOXVILLE, TENN., 700 tons, theater; George Fuller, general contractor.

PHILADELPHIA, 1800 tons, theater at Twentieh and Market Streets.

WORCESTER, MASS., 2000 tons, theater, stores and offices.

BOSTON, 1500 tons, post office garage.

BOSTON, Fields Corner, 200 tons, bus terminal.

WALTHAM, MASS., 100 tons, Metropolitan Hospital.

BROOKLYN, 1200 tons, theater on De Kalb Avenue.

LONG ISLAND CITY, N. Y., 7000 tons, Jackson Avenue section of subways; bids open Dec. 9.

CATSKILL, N. Y., 500 tons, highway bridge.

BOUND BROOK, N. J., 350 tons, highway bridge.

PENNSYLVANIA RAILROAD, 1200 tons, transmission towers.

CINCINNATI, 500 tons, building for Young Women's Christian Association.

CHICAGO, 1800 tons, bascule bridge on South Clark Street.

CHICAGO, 1200 tons, bascule bridge at Robey Street.

DULUTH, MINN., 700 tons, coal handling plant for Zenith Furnace Co.

ST. LOUIS, 1100 tons, Savoy Plaza Hotel at Twelfth and Pine Streets.

COUNCIL, OKLA., 500 tons, bridge for Rock Island Railroad.

SPOKANE, WASH., 1000 tons, Paramount Theater; bids in.

SEATTLE, 640 tons, Oregon-Washington viaduct; bids in.

LOS ANGELES, 3900 tons, Southern California Athletic and Country Club; bids being received.

PHOENIX, ARIZ., 600 to 1000 tons, plates, 36-in. line for reconstruction of Verde pipe line, awarded to Western Concrete Pipe Co., Los Angeles, for reinforced concrete pipe.

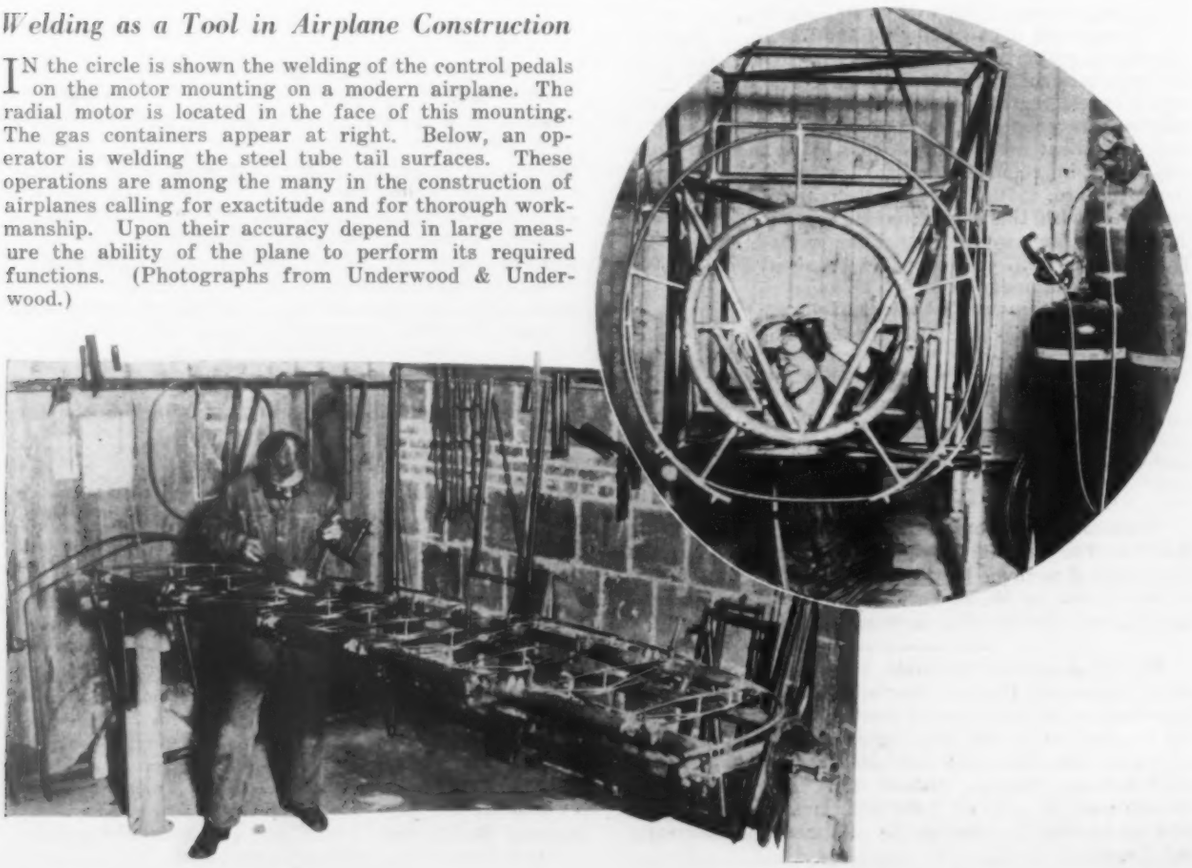
VENTURA, CAL., 620 tons of plates for 18 to 24-in. welded pipe line; alternate bids on cast iron pipe; bids Dec. 5.

SAN FRANCISCO, 3000 tons, Coyote Point bridge across San Francisco Bay; bids soon.

SAN FRANCISCO, 400 tons, addition to Medical-Dental Building; bids in.

Welding as a Tool in Airplane Construction

IN the circle is shown the welding of the control pedals on the motor mounting on a modern airplane. The radial motor is located in the face of this mounting. The gas containers appear at right. Below, an operator is welding the steel tube tail surfaces. These operations are among the many in the construction of airplanes calling for exactitude and for thorough workmanship. Upon their accuracy depend in large measure the ability of the plane to perform its required functions. (Photographs from Underwood & Underwood.)



PERSONAL

Officers of the Eastern Rolling Mill Co.

A. J. Hazlett, who has been elected president of the Eastern Rolling Mill Co., Baltimore, succeeding the late J. M. Jones, was born at Butler, Pa., in 1889, and was graduated from Gettysburg College in 1910. In the same year he entered the employ of the West Penn Steel Co., Brackenridge, Pa., where he spent four years in the operating department, and was then transferred to the sales department, later becoming district sales manager. In 1919 at the organization of the Eastern Rolling Mill Co. he was appointed sales manager, which position he held until his election to the presidency. Charles E. F. Clark, who has been made chairman of the board of the company, also succeeding the late Mr. Jones, has been vice-president of the company.

A. J. HAZLETT

James A. Downey, newly elected vice-president and treasurer, began his business career in 1906 with the Pennsylvania Railroad at Baltimore. In 1915 he became private secretary to the president of the Standard Shipbuilding Corporation, Shooters Island, N. Y., serving in that connection until 1917. He then became secretary of the Maryland Shipbuilding Co., Baltimore, and continued in that position until the formation of the Eastern Rolling Mill Co., of which he was elected assistant treasurer. On Feb. 23, 1921, he was made treasurer of the company.

C. A. Pennock, plant manager, who has been elected vice-president and general manager of the company, was associated for a number of years with the Lukens Steel Co., Coatesville, Pa. In 1905 he became plant superintendent of the Lalance & Grosjean Mfg. Co., Harrisburg, Pa., severing this connection nine years later to become superintendent of the Massillon Rolling Mill Co., Massillon, Ohio. In 1916 he was made superintendent of the sheet and tin plate plant of the Bethlehem Steel Co. at Sparrows Point, Md., joining the Eastern Rolling Mill Co. in 1919 in the capacity in which he served until his recent promotion.

L. J. Jones, who has been reelected vice-president and secretary, was also identified for a number of years with the Lalance & Grosjean company, leaving it in 1914 to become purchasing agent for the Massillon Rolling Mill Co. He became associated with the Baltimore Sheet & Tin Plate Co. in 1916, and was made secretary of the Eastern company at its inception. He became vice-president and a director of the company in 1925.

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A. C. Scully, for a number of years interested in F. J. Ryan & Co., Wissahickon Avenue and Yelland Street, Philadelphia, industrial heating engineers, has become actively identified with the company as its treasurer and will hereafter devote his entire time to the firm. As a result the name has been changed to Ryan, Scully & Co. Mr. Scully was for 15 years treasurer and half owner of the Lancaster Iron Works, Lancaster, Pa., and previously had been associated with his father in the Scully Steel & Iron Co., Chicago.

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William J. Davidson, president of the Staten Island Shipbuilding Co., Mariners Harbor, N. Y., is chairman of the board of the Heat Transfer Products, Inc., recently organized subsidiary of the Shipbuilding company. George T. Jacocks, former vice-president and works manager of the Whitlock Coil Pipe Co., Hartford, Conn., is president and general manager of the new company. Silvan J. Crooker, its vice-president in charge of engineering, has been chief engineer of the Whitlock Coil Pipe Co., and previously was associated for a number of years with the Bureau of Standards and Bureau of Mines. Walter S. Ogilvy, who has been elected vice-president in charge of manufacture and secretary of the company, was formerly superintendent of the Beach division, Whitlock Coil Pipe Co. George H. Bates, treasurer and general manager of the Staten Island Shipbuilding Co., will serve as treasurer of the new subsidiary.

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Fred H. Diehl, for many years purchasing agent of the Ford Motor Co., Detroit, has resigned and will be succeeded by A. M. Wibel, associated with the engineering department of the company for a number of years.

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W. W. Coleman, who has been elected president and chairman of the board of the Bucyrus-Erie Co., recently formed by a merger of the Erie Steam Shovel Co., Erie, Pa., and the Bucyrus Co., South Milwaukee, Wis., has been president of the latter company since 1911 and associated with it since 1905. After graduating in metallurgy from Lehigh University, Bethlehem, Pa., in 1895, he was associated with the Bethlehem Steel Co. for seven years. Before going with the Bucyrus Co. he was identified for three years with the Crucible Steel Co. and the Latrobe Steel & Coupler Co. E. K. Swigert, vice-president of the Bucyrus Co., has been elected senior vice-president of the new company, and F. B. McBrier, president of the Erie company, has been made a vice-president. Other officers are G. A. Morrison, vice-president and secretary; J. G. Miller, secretary; A. C. Vicary, D. P. Eells and W. M. Bager, vice-presidents. The two companies will continue to operate separately until Jan. 1, 1928, when the merger will become effective.

W. W. COLEMAN

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M. G. Ensinger, general superintendent of the Union Wire Rope Co., formed recently to succeed the Black Steel & Wire Co., Kansas City, Mo., has been field engineer and general executive for the American Cable Co. Previously he was field engineer for George C. Moon & Co. Walter Voigtlander, chief wire rope engineer for the new company, for the last five years has been chief sales and wire rope engineer for the American Cable Co. Curtis Voigtlander, chief wire engineer, was most recently chief engineer high carbon wire department for the Seneca Wire & Mfg. Co., Fostoria, Ohio. A. D. Galloway, superintendent of the company's rope mill, was formerly chief inspector of the American Cable Co.'s wire and rope mills.

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H. W. How, formerly chief engineer Buffalo Foundry & Machine Co., Buffalo, has been appointed permanent consulting engineer for the Struthers-Wells Co., Warren, Pa. Prior to the war he was in charge of the machine and plate shop of the Thomas C. Basehor Co., Baltimore. Later he was engaged by the Southern Menhaden Co., Jacksonville, Fla., to design and construct a complete process plant for the manufacture of fish fertilizer and oil. Before becoming associated with the Buffalo company he spent nearly three years in the navy as chief engineer officer and manager of the Naval Engineering Experiment Station at Annapolis.

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Dr. Robert J. Anderson, consulting engineer specializing in the metallurgy of aluminum, has become associated with the Fairmont Mfg. Co., Fairmont, W. Va., and will have charge of the chemical and physical laboratories of the company and otherwise supervise scientific research work.

Philip B. Sadtler, formerly vice-president Swenson Evaporator Co., a subsidiary of Whiting Corporation, Harvey, Ill., has been elected president of the Swenson company to succeed the late N. S. Lawrence. Mr. Sadtler has been with the Swenson organization for about 20 years and during this time has handled a wide range of chemical engineering problems involving evaporation and heat transfer processes. He is a graduate of Massachusetts Institute of Technology.

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Joseph Dilworth and John C. Dilworth, respectively secretary and mill manager, Dilworth, Porter & Co., Inc., Pittsburgh, have been elected vice-presidents of that company. They have assumed the duties of W. F. Schleiter, who resigned as vice-president and general manager of sales to become president Verona Tool Works, Verona, Pa.

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Dr. W. D. Coolidge, assistant director of the research laboratory of the General Electric Co., Schenectady, N. Y., has been awarded the Hughes medal by the Royal Society for "distinguished work on X-rays and the development of highly efficient apparatus for their production." The Hughes medal was first presented in 1913 to Dr. Alexander Graham Bell.

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J. Petin, G. Maitre and I. Delbos, Etablissements J. J. Carnaud el Forges de Basse-Indre, France, are in the United States on a tour of American steel plants.

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H. J. Eltz, works manager Brown & Sharpe Mfg. Co., Providence, R. I., presided at the November meeting of the Industrial Relations Association of Rhode Island held Nov. 17 at the Turks Head Club, Providence.

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W. F. Schleiter recently resigned as vice-president and general manager of sales Dilworth, Porter & Co., Inc., Pittsburgh, to become president Verona Tool Works, Verona, Pa. He succeeds W. F. Hart, who last July went to the Bethlehem Steel Co., Bethlehem, Pa., as manager of sales of the pipe and tube department. Mr. Schleiter was with Dilworth, Porter & Co. for 37 years, starting as an order clerk and working steadily upward to the position held when he made his recent change.

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A. A. Gatheman, district sales manager at Boston for the A. M. Byers Co., gave an illustrated talk on the manufacture of wrought iron pipe and pipe failures and corrosion at a luncheon given by the Building Owners and Managers Association at the Boston Real Estate Exchange on Nov. 17.

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W. W. Macon, managing editor THE IRON AGE, was the guest of honor at a dinner meeting of the Milwaukee Association of the Industrial Advertisers on Nov. 17. Executives of Milwaukee industrial plants were invited guests, and C. R. Messenger, president Chain Belt Co., was toastmaster.

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Alex H. Luedicke, chief engineer Gridley Dairy Co., Milwaukee, has been elected president of the Engineers' Society of Milwaukee. Fred Doepke, president Wrougth Washer Co., is the new vice-president. Walter R. Mueller, of Fred H. Dorner Co., was re-elected treasurer, and Robert Cramer, chief engineer Milwaukee Metropolitan Sewerage Commission, secretary. New directors are Hans Dahlstrand, of Allis-Chalmers Mfg. Co.; Harry Sloan, of Vilter Mfg. Co., and George A. Lueck.

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Alfred L. Carlson has been appointed sales engineer for the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., and will cover the Eastern territory with headquarters in New York. He was formerly associated with the Otis Elevator Co., New York; the Gisholt Machine Co., Madison, Wis., and the Henry Prentiss Co., New York.

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J. D. Cunningham, president of the Republic Flow Meters Co., Chicago, will be inaugurated Dec. 13, as president of the Illinois Manufacturers Association. Other officers to be installed include J. L. Donnelly, Western Cartridge Co., East Alton, first vice-president; E. N. Monroe, Monroe Chemical Co., Quincy, second vice-president, and Peter S. Theuer, Schoenhofen Co., Chicago, treasurer.

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F. H. Willcox, vice-president Freyn Engineering Co., Chicago, has just returned from a trip to Europe, where he visited Belgium, France, Germany, Luxemburg and England. The trip was taken in connection with contracts which the Freyn company is now executing, namely the remodeling of the Dudelange blast furnace plant at the Acieries Reunies de Burbach Eich Dudelange, Luxemburg, and the reconstruction of two furnaces at the Mannesmann Tube Works, Huckingen, on the lower Rhine. During his visit in Europe Mr. Willcox also made a study of methods used there for the conditioning of blast furnace gas and the use of blast furnace gas alone or in mixtures for coke oven, open hearth and heating furnace applications.

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Andrew H. McDougall, who has been appointed vice-president and director of sales for the Whiting Corporation, Harvey, Ill., succeeding the late N. S. Lawrence, has been associated with the company since 1903. He had early experience as a machinist for the E. D. Smith Co. on the Michigan-Lake Superior Power Canal project at Sault Ste. Marie, Ont., and served in a similar capacity for the Allis-Chalmers Mfg. Co., Milwaukee. After graduating from the University of Michigan in 1901 he spent two years as a designer of special wood and iron working machinery for the Studebaker Brothers Mfg. Co., South Bend, Ind. Going with the Whiting organization as a designer, he has been successively estimator, chief draftsman, chief engineer and vice-president and consulting engineer. He is a member of the American Society of Civil Engineers and the American Society of Mechanical Engineers.

A. H. MC DOUGALL

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R. T. Melville, resident manager in Buffalo for Rogers Brown & Crocker Brothers, Inc., will become associated with the M. A. Hanna Co. sales department, effective Dec. 1. He has been with one or other of the Rogers Brown organizations for 24 years, beginning with Rogers Brown & Co. Later he went to the Tonawanda Iron & Steel Co., a Rogers Brown connection, where he remained for some time before becoming identified with the Rogers Brown Iron Co. He returned to Rogers Brown & Co. in 1906, where he remained until becoming resident manager for Rogers Brown & Crocker Brothers, Inc., July 11, 1926.

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Gordon Fisher, president Spang, Chalfant & Co., Inc., Pittsburgh, will be the principal speaker at the mid-year dinner of the Traffic Club of Pittsburgh at the William Penn Hotel, Thursday evening, Dec. 15.

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Earl H. Collester, formerly assistant manager Steubenville works, Wheeling Steel Corporation, has been appointed manager of the newly created department of safety and welfare, Weirton Steel Co., Weirton, W. Va. He was active in the formation of the Eastern States Blast Furnace and Coke Oven Association and was its first secretary. Besides the experience in management of men in his most recent connection, he had that of several years as superintendent of the by-product coke oven

plant of the Wheeling corporation at East Steubenville, W. Va.

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Riichi Horioka of the Yasuki Steel Works in Japan is in this country investigating the market possibilities of Yasuki steel, a special steel which is used in the making of Japanese swords.

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Ernest Kugel, chief engineer of the Kalker Maschinenfabrik A. G. (Breuer-Schumacher), Cologne-Kalk, Germany, sailed Tuesday for Europe after spending two months visiting rolling mills in the United States.

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Joseph W. Marsh, president and general manager Standard Underground Cable Co., Pittsburgh, has been elected chairman of the board of the General Cable Corporation which was formed recently by the merging of the Standard Underground company; the Safety Cable Co., New York; the Rome Wire Co., Rome, N. Y.; the Dudlo Mfg. Corporation, Fort Wayne, Ind., and the sheet, rod and wire mills division of the Baltimore Copper Smelting & Rolling Co. Walter Robbins, of Kissel, Kinnicutt & Co., 14 Wall Street, New York, who has been named as president of the new corporation, has had operating and executive experience with the Western Electric Co., Chicago, and the Wagner Electric Corporation, St. Louis. He has also served as a director in the Safety Cable Co. Other officers elected for the company are as follows: William C. Hall, secretary and treasurer Safety Cable Co., treasurer; G. C. Thompson, comptroller, and G. K. B. Wade, special signing vice-president; H. T. Dyett, president Rome Wire Co.; Walter F. Field, vice-president Safety Cable Co.; George A. Jacobs, secretary, treasurer and general manager Dudlo Mfg. Co.; P. H. W. Smith, vice-president and assistant general manager Standard Underground Cable Co.; and Roger Strauss, vice-president American Smelting & Refining Co., have been made vice-presidents of the General Cable Corporation.

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A. E. Kelly has been appointed representative of the Donner Steel Co., Inc., Buffalo, in the sale of Niagara pig iron in New York, with offices at 2 Broadway.

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A. I. Kleynmans, vice-president Zeche Koenig Ludwig, a large coal mining and coke company, Recklinghausen, Germany, has returned to Europe after spending 10 weeks in this country studying American coal mining and coking practice. He was particularly interested in coal mining equipment adaptable to the thin veins characteristic of German coal deposits.

Another Decline in Employment in Metal-Working Shops

Shops affiliated with the National Metal Trades Association, Chicago, reported a total of 559,423 employees in October, as compared with 564,484 in September and 575,493 in August. The total in October, 1926, was 608,415. New England was the only section that reported a gain as compared with the previous month. Detroit reported a loss of 1361, and the entire State of Michigan showed a recession of 2538. Among cities reporting substantial gains were Toledo, Ohio, Fort Wayne, Ind., and Milwaukee, Wis.

Gain in Malleable Castings Production and Bookings

WASHINGTON, Nov. 22.—Bookings of malleable castings in October totaled 39,494 tons, against 37,912 tons in September, according to reports received by the Department of Commerce from 134 identical plants. Production in October amounted to 46,765 tons, while shipments were 41,666 tons. Operations were at the rate of 46 per cent of capacity, compared with 43.3 per cent in September.

Bookings for the 10 months ended with October totaled 480,319 tons, against 527,605 tons for the corresponding period of last year. Production for the two periods totaled 542,667 tons and 619,574 tons, respectively. The reductions from last year were 9 per cent in bookings and 12 per cent in production.

Head of Bolt Association Counsels Fairness in Selling and Buying

How the bolt and nut business has been put on a successful basis was outlined by Charles J. Graham, president Bolt, Nut and Rivet Manufacturers Association, Pittsburgh, in an address before the Los Angeles Advertising Club at the Biltmore Hotel, Los Angeles, on Nov. 15. With $150,000,000 of capital invested and consuming 20 per cent of the steel bars produced in this country, the bolt, nut and rivet industry found itself in 1924 very deeply in the unsuccessful class. Its total losses that year exceeded $12,000,000. It is now making a profit of approximately 4 per cent on its investment, which, while not sufficient, is regarded as a good beginning.

Selfishness, said Mr. Graham, is at the root of business difficulties. "Ways must be found to convince all that the radical price cutter in any line of industry is a menace not only to his competitor, but to the distributer, to the ultimate consumer and to the Government itself. He is the arch enemy of decent wages, decent living and decent profits.

"Buying right, from the standpoint of fair price, good quality and proper service," he said, "should be the present buyers' slogan. . . . The policy dictated by the executives of the General Motors Corporation to its buying departments a few months ago, advises them that they must cease their hard buying methods and be willing to pay a price that is fair to the manufacturer as well as to themselves, and that the prosperity of the companies as well as the prosperity of employees of the companies supplying their materials, is a necessity to their own prosperity."

Mechanical Engineers to Meet With Foundrymen in Newark

A joint meeting of the American Society of Mechanical Engineers, metropolitan section, will be held with the Newark Foundrymen's Association, Wednesday evening, Nov. 30, at the Downtown Club in Newark, N. J. E. H. Ballard, general foundry superintendent General Electric Co., Lynn, Mass., will deliver an address on the "Need for Closer Relations Among the Designing Engineer, Pattern Shop, Foundry and Machine Shop," and R. T. Turner, sales promotion manager Shepard Electric Crane & Hoist Co., will speak on "Mechanical Handling in Foundries." Both papers will be illustrated with lantern slides. S. H. Libby, consulting hoist engineer General Electric Co., Bloomfield, N. J., and formerly a foundryman, will act as chairman.

Commerce Chamber Creates Department for Industrial Group Effort

To promote the extension of industrial group effort the Chamber of Commerce of the United States, Washington, has created a new department to work with trade organizations. Dr. Hugh P. Baker, an economist who, as executive secretary of the American Paper and Pulp Association, has won recognition as an authority on trade associations, will head the department, assuming his duties on Feb. 1, 1928.

One of the main objects of the department will be to promote self-regulation by business groups, which has as its aim the elimination of economic wastes in every form. To that end the department will cooperate with the Federal Trade Commission and other Governmental agencies.

DUMPING DECISION THIS WEEK

Treasury Department Will Try To Close Case of Long Standing

WASHINGTON, Nov. 22.—Decision is expected to be reached this week by the Treasury Department in the so-called steel dumping case. This statement was made today to THE IRON AGE by Under-Secretary of the Treasury Ogden L. Mills. While it is not certain that a conclusion can be reached this week, it is hoped that a decision can be rendered so that the case, pending for a long period can be disposed of as officials feel that decision should not be delayed longer.

Considerable confusion has developed from this case and the published reports concerning it. Actually a report was made by the Customs division shortly after the case was submitted but it was returned to the division by high Treasury officials for reconsideration. Whether well founded or not, it is claimed that the original report was favorable to domestic steel producers, who have charged that there is dumping of steel from European countries, particularly Germany. Next there was a report that the Treasury Department virtually had concluded that imports of steel were so small that application of the dumping penalty was not justified, although the volume of imports, it has been frequently pointed out, is not the controlling factor as to whether or not domestic industry has been injured or is likely to be injured. The mere fact that foreign steel has been quoted at less than the home market abroad is claimed by domestic producers to be a threat to domestic industry when such prices are at a level which domestic producers cannot meet.

Recently there was a report that the State Department, upon representation by the German Embassy, had projected itself into the case as it did in the question of countervailing duties on German steel some time ago. However, it is understood that the State Department has not concerned itself with the dumping case but is considering another issue relating to duties on imports from Germany and their possible violation of the commercial treaty with that country. It is this latter question which has gone to the Department of Justice for decision. Definite announcement has been made that the steel dumping case has not been referred to the Department of Justice and that it is not likely that it will be.

OBITUARY

FREDERICK F. FITZPATRICK, president American Locomotive Co., New York, died on Nov. 16 at his home in Larchmont, N. Y., following a lingering illness. He was born at Peterborough, Ont., on June 9, 1866, and later removed with his family to Chillicothe, Mo., where he attended St. Joseph's Academy. He began work in the local Western Union office at the age of 15, and was later transferred to the company's Kansas City, Mo., office. He next served in the executive offices of the Missouri Pacific Railroad and in 1898 was made St. Louis representative for the Charles Scott Spring Co. He remained with that company after it was merged with the Railway Steel Spring Co. in 1902 and three years later was made general sales agent of the company, with headquarters in New York. He became vice-president of the Railway Steel Spring Co. in 1907 and president in 1910. When the Steel Spring company was merged with the American Locomotive Co. in 1925 he became president of the consolidated corporation. He was also president of the Montreal Locomotive Works, Ltd., the Canadian Steel Tire & Wheel Co. and the Richmond Locomotive Works. At the time of his death Mr. Fitzpatrick held directorships in these companies as well as in the American Brake Shoe & Foundry Co., the American Car & Foundry Co., the Railway Steel Spring Co., the Safety Car Heating & Lighting Co. the Superheater Co. and in a number of financial houses.

F. F. FITZPATRICK

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EMIL GUENTHER, founder and for five years head of the Philadelphia Foundry & Machine Co., Philadelphia, died on Nov. 16 at his home in Paoli, Pa. He had not been actively associated with the company since 1908, and was 70 years of age.

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FRED B. CHAPPELL, manager of the Glens Falls Machine Works, Glens Falls, N. Y., died on Oct. 25.

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EDWARD HUBBARD WELLS, since 1919 chairman of the board of the Babcock & Wilcox Co., New York, died on Nov. 17 at his home in Montclair, N. J. He was born at Dorrville, R. I., in 1859 and became associated with the Babcock & Wilcox organization in 1892. He was made president of the company in 1898. He was a director of the Worthington Pump & Machinery Corporation, the Atlantic Mutual Insurance Co. and the North American Co. and a member of numerous social and civic organizations.

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CARLETON A. CHASE, identified for a number of years with the Syracuse Chilled Plow Co., Syracuse, N. Y., and until 1920 its president, died suddenly in Philadelphia on Nov. 16, where he had gone to consult a specialist regarding his health. He was born at Syracuse in 1864 and became associated with the Plow company soon after leaving school. He became vice-president in 1902 and subsequently president, resigning in 1920 to become president of the First Trust & Deposit Co., Syracuse. He was a member of the National Founders' Association and of the National Association of Manufacturers, having served both organizations as vice-president. He was also a member of the National Industrial Conference Board for a number of years and had been prominently identified with many other civic and industrial organizations.

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HENRY G. TINKER, for many years general sales manager Wheeling Steel & Iron Co., Wheeling, W. Va., died at the home of his daughter in New Rochelle, N. Y., Nov. 18. He retired from the steel business about 15 years ago. His son, Charles Tinker, for many years was the Boston district sales manager for the La Belle Iron Works, Steubenville, Ohio.

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H. G. STEINBRENNER, vice-president and sales manager of the Industrial Brown Hoist Corporation, Cleveland, died Nov. 16, at the South Shore Country Club, Chicago. He became associated with the Brown Hoisting Machinery Co. about a year ago. For several years he had been works manager of the Interstate Engineering Co., which later became the McMyler-Interstate Co., Cleveland. Later he was a partner in the Orton-Steinbrenner Co., which is now the Orton Crane & Shovel Co., Chicago. In 1923 he became associated with the Burdick Tire Co., Noblesville, Ind., of which company he became president, and later directed its reorganization into the Steinbrenner Rubber Co.

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JOHN O. E. JOHNSON, president Johnson-Washburn Co., Boston, maker of steam fittings, died at his home in East Milton, Mass., on Nov. 17.

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JAMES M. DUNBAR, for many years associated with the New England Coal & Coke Co., Boston, and more recently with Rogers Brown & Crocker Bros., Inc., died on Nov. 17. He was 60 years old, and was one of the best known pig iron representatives in New England.

Use of Government Statistics by Business Men Growing

WASHINGTON, Nov. 22.—The number of American business men, bankers, economists and students who make use of the statistical information collected by the Government is increasing steadily each year, according to Director of the Census W. M. Steuart in his annual report. The United States, the report shows, ranks first as a compiler of statistics, these data covering practically every important phase of economic, business and social existence. During the past fiscal year the bureau published more than 3,500,000 items besides furnishing facts and figures in response to 48,000 letters of inquiry. More than 5,000,000 reports were received from individuals and enterprises and in addition the bureau did more or less tabulation work on an additional 11,000,000, making the total number of reports handled during the year in excess of 16,000,000.

Automobile Production Drops Further

Production of automobiles in October continued the downward movement of the immediately preceding months. As reported by the National Automobile Chamber of Commerce to the Department of Commerce, the total number of passenger cars produced in October by members of that chamber was 185,706. Of trucks, there were 35,586 turned out, making a total of 221,292 vehicles in the United States. This is the lowest figure since last December and, with that exception, it is the lowest since January, 1925. It compares with 257,464 vehicles in September, also confined to members of the chamber, and with a total for all makers in October, 1926, of 329,142.

Canadian production in October was 6236 passenger cars and 1555 trucks, a total of 7791 vehicles. This is the smallest Canadian figure since last December. It compares with September totals of 8681 passenger cars and 2581 trucks, while in October of last year the output was 10,595 passenger cars and 4075 trucks.

For ten months American production is reported at 2,694,570 cars and 378,345 trucks, an aggregate of 3,072,915. This compares with 3,408,194 cars and 396,874 trucks in ten months last year, a total of 3,805,068. If November and December show drops corresponding to their movement last year, the total for the year will be about 3,400,000 vehicles, including 2,950,000 cars and 450,000 trucks.

Increase in Commodity Prices

Wholesale prices of commodities recorded by the United States Bureau of Labor Statistics were higher in October, being 97 against 96.5 in September. Both figures are on the new base, which is 100 as an average for 1926. Of the ten major groups, three showed an increase during the month, these being foods, leather and chemicals. All other products declined.

Metals and metal products at 97.1 recorded a drop from 97.6 in September. Only three of the ten groups are lower than metal products. As the major groups are somewhat different from those which have been in vogue for several years, the appended table is given as a matter of record, showing the relationships of the prices on the 1926 base.

Index Numbers of Wholesale Prices, Based on 1926 as 100

	Oct., 1927	Sept., 1927	Oct., 1926
Farm products	105.0	105.9	97.9
Foods	100.0	96.5	100.8
Hides and leather products	113.0	112.5	101.0
Textile products	98.4	98.5	97.7
Fuels and lighting	83.8	84.2	101.3
Metals and metal products	97.1	97.6	101.0
Building material	91.6	92.1	99.5
Chemicals and drugs	97.1	96.4	99.1
Housefurnishing goods	98.5	98.6	99.4
Miscellaneous	88.3	89.2	93.4
All commodities	97.0	96.5	99.4

Total apparent consumption of Babbitt metal in October, based on reports received by the Department of Commerce from 31 firms, was 5,115,598 lb., compared with 4,792,367 lb. in September and 5,471,086 lb. in October, 1926.

Fabricated Steel Orders Exceed Shipments

WASHINGTON, Nov. 22.—New orders for fabricated structural steel in October increased to 229,033 tons, representing 83 per cent of capacity of the 187 reporting firms, with 277,080 tons monthly capacity. It compares with 212,305 tons booked in September, or 76 per cent of the capacity of 281,035 tons of the 200 reporting firms, according to the Department of Commerce.

Computed bookings in October were 263,940 tons, against 241,680 tons in September. Shipments were 232,140 tons, or 73 per cent of capacity, and 244,860 tons, or 77 per cent of capacity, respectively. For the 10 months ended with October computed bookings were 2,311,860 tons, compared with 2,133,780 tons for the corresponding period of last year. Shipments were 2,187,840 tons and 2,407,260 tons, respectively.

Orders have exceeded shipments by 6 per cent so far this year. Last year shipments exceeded orders by 12 per cent, the difference amounting, in the 12 months, to 289,380 tons.

Predicts Production of 5,000,000 Automobiles in 1928

That the production of automobiles and trucks will reach the 5,000,000 mark in 1928 was the prediction of John J. Raskob, chairman of the finance committee of the General Motors Corporation, speaking at a dinner for industrial leaders held in New York last week in honor of Prof. Edwin R. A. Seligman, of Columbia University, who has just completed a comprehensive survey of installment selling. Mr. Raskob estimated that 3,500,000 automobiles and trucks would be produced this year in the United States and Canada, and that with the Ford Motor Co. in production, a gain of about 40 per cent might be expected in 1928.

Manufacture of Machinery in 1925

Machinery to a total of $5,129,414,553 was made in the United States in 1925, according to a report of the Bureau of the Census. Copies of this report may be obtained at 10c. from the Superintendent of Documents, Government Printing Office, Washington. No comparable figure for the total is given for preceding years.

More than half of the amount was represented in motor vehicles, not including motorcycles. The amount given here was $2,946,821,212, compared with $2,611,734,958 in 1923. The largest of the other items were as follows:

	1925	1923
Engines and water-wheels	$317,254,544	$266,039,760
Metal-working machinery	138,812,149	91,459,403
Electrical machinery	134,513,423	128,384,498
Pumps and pumping equipment	121,299,431	92,814,688
Textile machinery and parts	109,354,126	127,406,348
Agricultural machinery	85,470,736	82,130,319
Washing machines for domestic use	70,239,872	57,550,706
Printing machinery	69,216,683	68,629,762
Refrigerating machinery	62,592,637	36,541,766
Locomotives	58,359,274	194,673,098
Adding and calculating machines	51,289,428	51,995,600
Typewriters and parts	50,189,986	39,520,680

Production of Portland cement in October is reported by the United States Bureau of Mines at 17,174,000 bbl., a reduction of 2 per cent from the 17,505,000 bbl. of September and of nearly 7 per cent from the 18,315,000 bbl. of August, which was the highest total ever made in any month. The October output was nearly 4 per cent greater than that of October, 1926, which was 16,596,000 bbl.

Mechanical stokers to the number of 95, with a total rating of 27,222 hp., were sold in October, against 104 with 27,843 hp. in September, according to reports received by the Department of Commerce from 12 establishments. Except for last April, the October rating showed the smallest monthly total in over two years.

Sectional Meeting of Mining and Metallurgical Engineers

The St. Louis and Chicago sections of the American Institute of Mining and Metallurgical Engineers met at Danville, Ill., Nov. 11 and spent Saturday at the University of Illinois, Urbana, Ill., where they inspected the coking plant of Prof. S. W. Parr, the State geological survey office and laboratories and department of mine engineering and foundry laboratory.

More than 150 members of the institute attended the banquet Friday night in the Hotel Wolford, Danville, which followed a day of sightseeing at Danville industrial plants. Professor Parr, lecturing on "Low-Temperature Carbonization of High-Oxygen Coals," related briefly the history of technical experiments which have resulted in successful manufacture of coke from Illinois coal, and Don Milo Ketchum of the University of Illinois college of engineering described tests and experiments being made at the university in association with various industries. Prof. A. C. Noe of the University of Chicago related impressions of industrial Soviet Russia gained during his recent trip.

Power Transmission Advisory Committee

In announcing the annual meeting of the Power Transmission Association for Dec. 7, in the Hotel Commodore, New York, mention is made of the new merchandising advisory committee which has been erected for the purpose of studying outlets and preparing recommendations with regard to activities of the association and of its company members. William W. French, of the Dodge Mfg. Corporation, Mishawaka, Ind., is chairman of the committee. The other members are as follows:

J. R. Hopkins, advertising manager, Chicago Belting Co., Chicago; W. W. Warr, Manhattan Rubber Co., Passaic, N. J.; E. T. Cregier, sales manager Medart Co., St. Louis; Wylie K. Lee, president Clipper Belt Lacer Co., Grand Rapids, Mich.; H. M. Carroll, advertising manager Hyatt Roller Bearing Co., Harrison, N. J.; Russell C. Ball, president Philadelphia Gear Works, Philadelphia; F. E. Barth, vice-president Graton & Knight, Worcester; and E. A. Emmons, sales manager Foote Brothers Gear & Machine Co., Chicago.

Welding Conference at Purdue University

Purdue University will hold its third welding conference at Lafayette, Ind., Dec. 13, 14, 15. Through the courtesy of leading manufacturers, lectures on structural welding, pipe welding, and cutting will be presented, together with demonstrations of newly developed equipment and methods. All sessions are open to the public without charge.

Electric Heat-Treating Conference at Yale

A conference on industrial electrical heat treatment is to be held at Yale University, Wednesday, Nov. 30, under the direction of the electrical engineering department, arranged in cooperation with the Manufacturers Association of Connecticut. There are to be three sessions, morning, afternoon and evening. At the morning session three members of the Yale staff will present the scientific and engineering background. The afternoon papers will be presented by three engineering representatives of companies manufacturing electric heating equipment.

The remainder of the program in the afternoon and in the evening will be devoted to a presentation of the viewpoint of users. Representatives from a few of the New England industries will contribute their experiences and views. There will also be a message from one of the automobile manufacturers of Detroit, and a film showing the use of electric heat in the industries of the Middle West will be presented. The program for the three sessions follows:

"Industrial Electrical Heat," by C. F. Scott, professor of electrical engineering; "How Electricity Heats and Its Control," by W. B. Hall, assistant professor of electrical engineering; "From Guess to Science in Heat Treatment," by C. H. Mathewson, professor of metallurgy, all of Yale University; "Electric Furnaces for Heat Treating," by Wirt S. Scott, special representative Westinghouse Electric & Mfg. Co., Mansfield, Ohio; "How Electric Heat Treatment Affects Production Costs," by C. L. Ipsen, engineer General Electric Co., Schenectady, N. Y.; "Labor Savings Resulting from Continuous Automatic Electric Furnaces," by R. E. Talley, president and chief engineer George J. Hagan Co., Pittsburgh; "Equipment and Methods of Heat Treatment at Dodge Brothers," by H. E. Martin, assistant metallurgist Dodge Brothers, Inc., Detroit; "Electric Annealing of Stillson Wrench and Other Forgings at Walworth Co.'s Boston Works," by John J. Harman, research engineer Walworth Co., Boston, Mass.; "Hardening of Small Tools," by A. H. d'Arcambal, consulting metallurgist Pratt & Whitney Co., Hartford; "Electric Heating in Industry," a film prepared by Detroit Edison Co.

Electrochemists to Discuss Industrial Electric Heating

Besides a symposium on "Chemical Production of Electricity" at the annual spring meeting of the American Electrochemical Society at Bridgeport, Conn., April 26 to 28, there has also been arranged a session on industrial electric heating. This session will be followed by a round table discussion on "The Melting of Non-Ferrous Alloys in Low Frequency Induction Furnaces." On Thursday evening, April 26, Prof. Bergen Davis, Columbia University, will deliver a lecture on "X-Ray Structure of Metals." It will be illustrated and new photographs will be included. On Saturday morning, April 28, a session devoted to the electrodeposition of silver, nickel, brass and chromium is being arranged. John L. Christie, chairman of the Bridgeport local committee, is arranging a social program and visits to industrial plants in the vicinity.

Power Transmission by Belt

It is pointed out by the Power Transmission Association that 145 of the 254 machines exhibited at the Cleveland Machine Tool Show were provided with individual drive by means of a short belt from the motor. All of the 254 units were motor-driven, but more than half of them used a belt as the intermediary. Of the remaining group, 39 were direct-connected, 31 driven by chain, 19 by gears, 17 by pulleys, while three were provided with a speed reducer. The short belts used were made of leather, rubber, fabric, or canvas.

Many Industries Using Facilities of Bureau of Standards

WASHINGTON, Nov. 22.—The Bureau of Standards is cooperating with more than 200 scientific, technical and industrial organizations in the solution of their problems, according to the annual report of Director George K. Burgess. "Research associates," whom industrial groups are privileged to send to the bureau to work on problems of interest to their respective industries, now number 63 and represent 36 separate industries. Results obtained are quickly applied by the industries concerned so that the public early reaps the advantages of new discoveries or improved processes.

The number of tests made by the bureau has doubled over a five-year period. During the past fiscal year approximately 150,000 of these tests were completed, of which 76,000 were made for Government departments and State institutions and 64,000 for industries and individuals. The total fees collected for these tests aggregated nearly $500,000.

Doctor Burgess makes several recommendations looking to the increased usefulness of the bureau. These include a consolidation of some of the numerous funds under which the bureau operates, which would greatly simplify the administrative routine; an increase in the appropriation for fundamental research and testing; the establishment of a national hydraulic laboratory and increased support for the branch laboratories which are maintained at Northampton, Pa., Denver and San Francisco. The purchasing of Government supplies on a specification basis, Doctor Burgess says, has greatly increased the need for testing facilities at these points.

European and British Buying Spotty

British Rebates Not Very Effective—Wire Rod Cartel Fails to Control Prices—Germany Building Steel Dwellings

(*By Cable*)

LONDON, ENGLAND, Nov. 21.

CLEVELAND pig iron is quieter, but makers are maintaining prices aided by the restricted output. Continental iron and steel shipments are still arriving, but fresh contracts are dwindling as competition decreases.

Some domestic consumers have bought Cleveland iron for delivery up to June. Hematite is lacking in strength, as the price is uncontrolled and there is keen competition for tonnage. Foreign ore is quiet.

Finished steel is dull generally although inquiry has improved. Export demand is still slack. A new company is to be formed under the name of Vickers-Armstrong, Ltd., with capital not exceeding £21,000,000, to take over certain branches of manufacture of Vickers, Ltd., and Armstrong, Whitworth & Co.

Welsh tin plate demand is increasing and some good tonnage has been placed both for domestic and export shipment. Users are displaying keen interest in the minimum price, agreed upon as 17s. 9d. ($4.31) per base box, f.o.b. works port. Some mills are already asking 18s. ($4.37) per base box and more for far forward shipment. In some instances domestic consumers have purchased for delivery up to June.

Galvanized sheets are weak and demand is poor. Black sheets generally are quiet.

Continental markets are firm as a result of restricted output, but business is spasmodic. Export demand is quiet except for some purchasing by British tin plate works of Continental tin plate bars.

BRITISH MARKET DULL

Rebates On Steel Not As Effective As Expected —Steel Merger Projected

LONDON, ENGLAND, Nov. 11.—Activity in iron and steel is still largely confined to pig iron and even in this market the volume of business has decreased during the past week. Consumers seem to be fairly well covered, at least on Cleveland iron, and there is not much interest in buying for extended deliveries.

Producers of Cleveland iron, being well booked with business and having reduced their stocks to a minimum, are in a fairly independent position and there is little evidence of any further reduction of prices. The 2s. 6d. (61c.) concession granted to buyers in Scotland and in foreign markets is meeting with disapproval from the Middlesbrough iron consumers, but makers are seeking to recapture these markets, which have been purchasing on the Continent. The movement of foreign iron to the United Kingdom seems to have been checked as new purchasing of European iron is small, although there is a heavy tonnage still under contract.

Business in finished iron and steel is still disappointing. The rebate plan of steel makers, introduced in September, has not been the success that had been expected, although mills producing ship steel have benefited to a certain extent as a number of new ships have been placed recently. Consumer buying is still confined to small lots for immediate needs because of the belief that the price situation is still insecure. Recently a prominent steel manufacturer pointed out that steel prices in this country are only about 16 per cent above the pre-war level, compared with a general average of 46 per cent higher for other wholesale prices. Despite this, British mills are unable to meet the competition of the Continent.

Reports from the Continent show that orders are not being booked very freely by steel mills, except in Germany where the domestic market is still active. Efforts to control production of various commodities are not altogether successful and the recent failure of Belgian mills to agree on the proposed sales organization for semi-finished materials and beams serves to show the difficulties encountered in organizing Continental associations to maintain a profitable price level.

British producers are continually urging combinations and selling agreements, but thus far there have

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.86 per £ as follows:

Durham coke, del'd.	£0	17½s.				$4.25		
Bilbao Rubio ore†	1	1				5.10		
Cleveland No. 1 fdy.	3	10½	to £3	12½s.		17.13*	to	$17.62*
Cleveland No. 3 fdy.	3	7½				16.40*		
Cleveland No. 4 fdy.	3	6½				16.16*		
Cleveland No. 4 forge	3	6				16.04*		
Cleveland basic (nom.)	3	15	to 3	15½		18.23	to	18.35
East Coast mixed	3	10	to 3	12		17.01	to	17.50
East Coast hematite	3	12½				17.62		
Rails, 60 lb. and up	7	15	to 8	0		37.67	to	38.88
Billets	6	0	to 6	10		29.16	to	31.59
Ferromanganese	13	0				63.18		
Ferromanganese (export)	11	10	to 12	0		55.89	to	58.32
Sheet and tin plate bars, Welsh	5	7½	to 5	15		26.12	to	27.95
Tin plate, base box	0	17¾	to 0	18¼		4.31	to	4.43
Black sheets, Japanese specifications	13	5	to 13	10		64.40	to	65.61
						C. per Lb.		
Ship plates	7	12½	to 8	2½		1.65	to	1.76
Boiler plates	10	10	to 11	0		2.28	to	2.39
Tees	8	2½	to 8	12½		1.76	to	1.87
Channels	7	7½	to 7	17½		1.60	to	1.70
Beams	7	2½	to 7	12½		1.55	to	1.65
Round bars, ¾ to 3 in.	7	5	to 7	15		1.57	to	1.68
Steel hoops	10	10	to 11	0		2.28	to	2.39
Black sheets, 24 gage	10	5	to 10	10		2.22	to	2.28
Galv. sheets, 24 gage	13	5	to 13	10		2.87	to	2.93
Cold rolled steel strip, 20 gage, nom.	14	0	to 14	5		3.03	to	3.09

*Export price, 2½s. less for 500 tons or more.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	0s.	to £3	1s.		$14.58	to	$14.82
France	3	0	to 3	1		14.58	to	14.82
Luxemburg	3	0	to 3	1		14.58	to	14.82
Basic pig iron:								
Belgium	2	18	to 3	0		14.09	to	14.58
France	2	18	to 3	0		14.09	to	14.58
Luxemburg	2	18	to 3	0		14.09	to	14.58
Coke	0	18				4.37		
Billets:								
Belgium	4	3	to 4	5		20.17	to	20.66
France	4	3	to 4	5		20.17	to	20.66
						C. per Lb.		
Merchant bars:								
Belgium	4	15	to 4	16		1.05	to	1.06
France	4	15	to 4	16		1.05	to	1.06
Luxemburg	4	15	to 4	16		1.05	to	1.06
Joists (beams):								
Belgium	4	10	to 4	12		0.99	to	1.02
France	4	10	to 4	12		0.99	to	1.02
Luxemburg	4	10	to 4	12		0.99	to	1.02
Angles:								
Belgium	4	13				1.03		
¼-in. plates:								
Belgium (a)	6	5	to 6	6		1.38	to	1.39
Germany (a)	6	5	to 6	6		1.38	to	1.39
5/16-in. ship plates:								
Belgium	6	0	to 6	1		1.32	to	1.33
Luxemburg	6	0	to 6	1		1.32	to	1.33
Sheets, heavy:								
Belgium	6	1				1.33		
Germany	6	1				1.33		

(a) Nominal.

been no definite results, except in the single instance of the partial merger of Vickers, Ltd., Sheffield and Armstrong, Whitworth & Co., Newcastle-on-Tyne. These two companies have decided to amalgamate certain branches, principally the plants used for naval shipbuilding, armaments and special steels. A new corporation is to be formed to operate these branches after Jan. 1, 1928.

Germany Begins Manufacture of Steel Houses

HAMBURG, GERMANY, Nov. 5.—The United Steel Works and the United Upper Silesian Steel Works have simultaneously entered into the manufacture of steel houses. The parts of these houses will be made in different plants and assembled on the building site. The average time of construction of such buildings is placed at three weeks and less. At present only single family dwellings will be produced in three types; four, five and six rooms and bath. In the six-room house two small chambers under the roof are provided.

The walls of these dwellings are to be made of pressed blast furnace slag, which, following two years of tests, is said to be cooler in summer and warmer in winter than other materials. When painted, it is claimed that these steel houses show no evidence of being constructed of other than the usual materials. The present schedule of the two producers calls for 2900 such dwellings a year and this output can be increased to about 8000. Several hundred of these houses have been ordered for erection in Berlin, Leipzig, Duisburg and other German cities. Inquiries for export have been received and sales abroad are expected to develop as the small units of the houses can be easily shipped to foreign countries.

German Exports of Tested Ship Plates Increasing

HAMBURG, GERMANY, Nov. 5.—The character of exports of German ship plates has shown a slight change in the increased demand from abroad for tested material. Prior to the war only a small quantity of ship plates was exported after tests of the Germanische Lloyd, about 2.70 per cent of the total. Today about 26 per cent of all exports of ship plates, 3/16 in. and heavier are tested. The principal purchasers are Great Britain, Italy and the Scandinavian countries and Japan is purchasing increasing tonnages of tested plates. Although quotations for 3/16 in. plates are £6 17s. 6d. per metric ton (1.52c. per lb.) and for ¼ in. and heavier £6 15s. per ton (1.49c. per lb.), f.o.b. Antwerp, including testing charges, mills are booking plenty of new business and some are offering as long as 10 weeks deliveries. Current prices are about 7s. 6d. ($1.82) per ton above the French and Belgian markets.

Transatlantic Rate War to Brazil Ended

HAMBURG, GERMANY, Oct. 29.—Exports to Brazil have gained considerably as a result of the sharp competition between the shipping conference and outsiders. This situation reacted to the advantage of France, Belgium and Germany as the low rates of non-members of the conference were met by the conference lines. As a result the c.i.f. rate for barbed wire dropped from 40s. ($9.72) per ton to 17s. 6d. ($4.25) and there was a similar decrease on other steel products. This era of low ocean freights to Brazil seems to have come to an end, however, as the outsiders have agreed to enter the conference, with the exception of the Brazilian Lloyd line. This one outsider, however, has not been underquoting the conference rate and will doubtless uphold the higher charges, not becoming a member because of its position as a Government enterprise. This may result in a sharp rise in freight rates to Brazil from European countries, which will affect exports to the advantage of American producers.

The Pacific Coast Steel Co. recently took out group insurance to the amount of $1,155,000 on 518 of its employees.

EXPORT INQUIRY LIGHT

Japanese Buying British Sheets—Oil Company To Buy 69,000 Boxes of Tin Plate

NEW YORK, Nov. 22.—Export of iron and steel continues small with the limited current purchasing from Far Eastern markets going to Continental mills. The small volume of orders for light gage black sheets by Japanese merchants is apparently going to British mills, which are quoting several dollars a ton under the American price. The recent inquiry of the Nippon Oil Co. in Japan for 28,000 base boxes of oil can tin plate has been increased to 69,000 base boxes, bids on which were opened yesterday in Tokio. Tin plate for export averages at present about $4.35 per base box, Pittsburgh.

Importers of European steel in New York report but little tonnage of structural material being sold to American consumers at present. There has been a fair volume of activity in hoops and bands from German and Beligan mills, but prices in Continental markets are beginning to advance, so that the recent quotations of 2c. and slightly less, c.i.f. Atlantic port, at which some business was closed are believed to be no longer possible. Recently hoops have been quoted on the Brussels Bourse at 1.14c. per lb., base. Importers are offering wire rods of European origin at slightly less than the American quotation and some small tonnages have been closed recently.

Wire Rod Prices Lower Despite Cartel

HAMBURG, GERMANY, Nov. 5.—The recently established International Wire Rod Association evidently exercises but little control over prices. The official cartel quotation is £5 10s. ($26.73) per ton, f.o.b. Antwerp, but on the Brussels steel exchange almost any quantity can be purchased at £5 5s. ($25.52) per ton. Consequently the cartel is beginning to be considered as of less importance than had been expected.

Swedish Iron and Steel Output Shows Decline

WASHINGTON, Nov. 18.—Swedish production of both pig iron and steel ingots during the first nine months of 1927 was at an appreciably lower level than in previous years, according to a report to the Department of Commerce from the consul-general at Stockholm, but both imports and exports have shown marked gains.

Imports of iron and steel by Sweden during the first nine months of this year totaled 207,107 metric tons compared with 180,651 tons in the same period of last year. Exports increased from 132,952 tons in 1926 to 191,085 tons this year. The industry has received some governmental assistance through the Royal decree, effective Sept. 24, placing an absolute prohibition on the exportation of malleable iron scrap until Feb. 29, 1928.

According to a report received by THE IRON AGE from a European correspondent, Swedish iron ore shipments declined sharply in October, the total amounting to 870,000 metric tons, compared with 1,070,000 tons in September and 1,140,000 tons in August. The October shipments, however, were larger than in the corresponding months of 1925 and 1926. A resumption of large tonnage shipments is expected for November.

Canada's Northern Industrial Areas

That the industrial areas of Canada are not confined to the large cities, nor to the southern and first settled sections, is illustrated in a new map by the Natural Resources Intelligence Service of the Department of the Interior, Ottawa. It is called "an economic map of Central Canada, featuring transportation and commercial development." It covers the district between Montreal and Winnipeg. There have been indicated in this section the agricultural areas, the main mineralized areas, the principal mining centers and divisions, smelters, refineries, power developments, transmission lines, pulp and paper mills, roads, railroads and trading posts.

AMERICAN MERCHANT SHIPS

Less Than 30 Per Cent of Our Foreign Trade Is Carried in Our Own Bottoms

WASHINGTON, Nov. 22.—American ships entering or leaving domestic ports in the calendar year 1926 numbered 1678, with an aggregate gross tonnage of 7,336,000, out of a total of 5761 vessels with 26,330,000 gross tons, according to a report compiled by the United States Shipping Board, showing that more than 70 per cent of the ships sailed under flags of foreign countries. There were 32 different countries represented among the carriers of American freight and passengers. American exports amounted to 68,373,000 gross tons, while imports totaled 44,888,000 tons. The foreign trade of 1926 indicates that the nation's freight bill exceeded $728,000,000; of this sum a conservative estimate indicates that $480,000,000 was paid to foreign shipping companies.

Current reports of the Bureau of Research show that on Oct. 1, 1927, the privately-owned American merchant marine included 1230 steam and motor vessels of 1000 gross tons and over, with a total gross tonnage of 6,034,845. More than 91 per cent of this tonnage was in active service on that date. Of this number, however, only 170 vessels were engaged in overseas foreign trade, the remainder of the active fleet being employed in coastwise and Caribbean routes. The Shipping Board fleet on Oct. 1 included 801 vessels, 280 of which were engaged in overseas foreign trade routes.

The 1926 analysis shows that American vessels were proportionately more numerous in the tanker traffic than in the other trades.

Steel Railroad Ties to Be Used by Belgian Railroads

WASHINGTON, Nov. 22.—The National Railway Society of Belgium has decided to try steel instead of wooden ties and will place an order for 60,000 steel ties with the Belgian industry, according to a report received by the Department of Commerce from the American Commercial Attache at Brussels. The ties will be first tried out on the line running from Liege. If these tests give satisfactory results, the society is said to be contemplating the replacement of the old wooden ties.

Export Trade Gained $500,000,000 by Government Aid

WASHINGTON, Nov. 22.—Trade promotive services of the Bureau of Foreign and Domestic Commerce during the past fiscal year brought approximately $500,000,000 to American business, according to the annual report of Director Julius Klein. The total appropriation for the bureau during the year was $3,263,000. That the American business man is taking advantage in an increasing degree of the assistance offered him by the Government in foreign trade is evidenced by the progressively increasing number of trade promotion services rendered, Doctor Klein pointed out. During the past fiscal year the total number of these commercial services reached a figure nearly 25 per cent greater than that of the previous year, and five times that of 1922.

The report says the passage of the Hoch bill by Congress, under which the bureau's foreign service is placed on a statutory and permanent basis, has had a most salutary effect on the morale of the entire overseas staff. Besides its regular foreign staff assigned to general commercial and economic investigations, the bureau has in the field 27 special commodity trade representatives, 12 of whom were appointed during the year. Six new branch offices of the bureau were established during the year, bringing the total to 23.

The machinery for promoting American foreign trade is now functioning with such efficiency that it has become possible for the bureau to devote increasing attention to the needs of domestic business, according to Doctor Klein. The report says that during the fiscal year there has been strong evidence that the business interests of the country have awakened to the importance of the bureau's activities as an agency for the elimination of waste in domestic distribution and promotion generally of better domestic business methods.

The total value of business transactions each year in the United States is estimated at approximately $80,000,000,000, of which 10 per cent "may be said to represent waste in distribution." The total loss to industry, therefore, it is declared, is around $8,000,000,000, or $3,000,000,000 more than the value of the total export trade. To find a solution of this outstanding problem of waste in business is the chief function of the Domestic Commerce Division. The total money available to the bureau for domestic commerce work for the fiscal year was about $200,000, about one-fifth of the appropriation for foreign trade promotion.

Valley Steel Mill Operations Show Little Improvement

YOUNGSTOWN, Nov. 22.—Approach of the year-end in the Mahoning Valley is bringing little improvement to conditions in the iron and steel trade. Producers generally are hopeful that price advances in plates, shapes and merchant bars will spread to other finished steel lines. Price irregularities are especially manifest in steel sheets and in strip steel. It is considered likely that definite steps will be taken before the end of this year to advance the market, the increases to apply on first quarter of 1928 tonnages.

In the meantime, however, operations show little response. This week, 65 to 70 sheet mills of 127 in the Valley are scheduled, 12 of 20 pipe mills are under power, and 23 of 53 independent open-hearth furnaces are melting.

Ohio Foundries Report Decline in Employment

Employment in Ohio foundries and machine shops in October declined 1 per cent as compared with the previous month and was 10 per cent below that of October, 1926, according to the current bulletin issued by the Bureau of Business Research of Ohio State University. The report is based on figures furnished by 66 shops. Cincinnati and Cleveland each made small gains, but these were more than offset by unfavorable conditions in other cities, notably Dayton. Ten steel plants and rolling mills reported a continuation in October of the downward trend in employment that began in June, the decrease from September amounting to 7 per cent and from October, 1926, 21 per cent.

Continued Increase in Union Wage Rates

Union wage rates continued into 1927 the steady increase which has been taking place almost uninterruptedly during the past 20 years, according to the annual report of the Bureau of Labor Statistics. In the 66 important industrial cities which were included in the survey the average hourly rate in 1927 for the time-work trades included was $1.19 as compared with $1.15 in the preceding year. The upward movement was quite general among the various organizations, although the increase was not entirely uniform and a few trades showed slightly lower rates in 1927. There was also a further reduction in hours of labor, the average in 1927 having been 45.2 hr. per week.

The report also brought out the need for intensified accident prevention activity. Of 24 industries for which accident records were available in a number of States, 15 showed a decline in frequency of accidents during 1926 as compared with 1925. In nine industries the frequency rate rose. The severity rate, however, showed an increase in all but six of these 24 industries.

Intercoastal Rates on Tin Plate Advanced

Effective from Nov. 11, the contract rate of intercoastal steamship lines on tin plate for shipment from Atlantic seaboard to the Pacific Coast was advanced from 30c. on "A" line boats and 25c. on the "B" line boats, to 40c. on the "A" boats and 35c. on the "B" boats, in carloads of 36,000 lb. and over.

Machinery Markets and News of the Works

BUSINESS STILL SPOTTY

Machine Tool Orders Fairly Good at Chicago and Cleveland

Other Districts Show No Gains and November May Drop Below October in Gross Sales

IN all districts machine tool business continues spotty, but the volume this month in the Chicago and Cleveland districts makes a fairly good comparison with October sales. The index of machine tool orders in October prepared by the National Machine Tool Builders' Association shows that orders in that month were only slightly ahead of those in September and, as October should be a month of heavy shipments and orders, this report indicates "a relatively slow demand for this time of year."

In the Chicago market the principal buying has been done by the Nash Motors Co. for its Racine, Wis., plant and by the International Harvester Co. for the tool room at its Deering plant in Chicago. Buying in the Cleveland market has been mostly in small lots, but the aggregate has been fairly good. Cincinnati machine tool builders report buying as slow. Many prospective orders are being held up awaiting a turn in the general business situation. In the East conditions are virtually unchanged.

The Norfolk & Western Railroad, which has recently taken prices on 104 items of shop equipment, probably will not make its purchases until some time next month. Railroads centering in Chicago have obtained prices for budget purposes, but otherwise are taking no interest in the market. Unless the Norfolk & Western list is bought, there will be little or no railroad purchasing during the remainder of this year.

New York

NEW YORK, Nov. 22.

INQUIRIES for machine tools are more numerous than in the earlier part of the month, but November will probably bring out a smaller volume of actual purchasing than October as many of the current inquiries are apparently for inventory purposes and for estimating on appropriations for next year. Lathe manufacturers are beginning to ask higher prices and in some instances have advanced 5 to 10 per cent on new business, effective on outstanding quotations Dec. 1.

Among lists of tools not expected to develop into orders is an inquiry for about 25 machine tools for railroad shops in India, available through the Bureau of Foreign and Domestic Commerce, Custom House, New York. On most items the list specifies British products or equivalent. The New York Central Railroad is taking bids on a radial drill and an engine lathe. Among recent purchases in this district was the greater part of the list of eight small tools for the Otis Elevator Co., Yonkers, N. Y., the entire purchase totaling about $10,000.

Reports of recent purchases include a 14-in. vertical surface grinder by a company in Cincinnati, a gear-driven profiling machine by an Illinois electrical manufacturer, a 6-in. vertical shaper by a tractor company in Illinois, a single spindle drill by a Detroit tool maker, an automatic worm grinder by an Ohio gear maker and a 13 x 48-in. lathe by an Ohio lathe manufacturer. A Chicago company has purchased a 7 x 32-in. bench lathe, a New York State electric company two grinders for spline milling cutters, a storage battery manufacturer in New York two 13 x 30-in. lathes, a Wisconsin truck body manufacturer an 8-in. rotary surface grinder and an electric manufacturer three 1 x 18-in. automatic lathes and one automatic centering machine.

The Peelle Co., Stewart Avenue and Harrison Place, Brooklyn, manufacturer of elevator fire doors, etc., will soon take bids on a general contract for a two-story addition to cost close to $45,000. Koch & Wagner, 32 Court Street, are architects.

The Alfred Covered Wire Co., 248 Lafayette Street, New York, has leased space in the building at 75 Spring Street for expansion.

The Pelham Bay Garage Co., 391 East 149th Street, New York, will erect a two-story service, repair and garage building, 103 x 169 ft., to cost approximately $100,000 with equipment. William Shary, 41 Union Square, is architect.

The International Paper Co., 100 East Forty-second Street, New York, has approved plans for the immediate construction of a hydroelectric generating plant on the Saranac River, at Kents Falls. It will have an initial capacity of 8000 hp. to. to be increased later to 12,000 hp., and will be tied in with a similar station of the company in operation at Cadyville, N. Y. A transmission line will be built. The entire project is reported to cost more than $250,000.

The Parker-Kalon Corporation, 352 West Thirteenth Street, New York, manufacturer of hardware specialties, has leased about 50,000 sq. ft. of floor area in a new building at 200 Varick Street, and will remove to this location.

The Department of Water Supply, Gas & Electricity, Municipal Building, New York, N. J. Hayes, commissioner, has plans for a new mechanical construction and repair shop at 28 Vandewater Street, reported to cost more than $50,000 with equipment.

The Arch Built Corrugated Products Corporation, 147 Forty-first Street, Brooklyn, has leased space in the Bush Terminal industrial buildings, South Brooklyn, for expansion.

The Walker-Turner Co., Inc., 15 Murray Street, New York, manufacturer of household tools, will purchase the five-story factory at 66-70 York Street, Jersey City, N. J., formerly used by the Thompson Radio Co., for a new plant. The present works will be removed to the new location.

The New York Edison Co., Irving Place and Fifteenth Street, New York, has filed plans for a one-story power substation and distributing plant at 228th Street and the Spuyten Duyvil Road, 70 x 125 ft., to cost $150,000 with equipment. William Whitehill, 709 Sixth Avenue, New York, is architect.

F. LeRoy Stearns, 101 Park Avenue, New York, architect and engineer, has plans for a two-story automobile service, repair and garage building in Brooklyn, to cost $175,000 with equipment.

The Huntoon Ice Co., Inc., 91 Seventh Avenue, New York, will build a one-story plant, 50 x 92 ft., to cost about $65,000. Russell G. Cory, 30 Church Street, is architect and engineer.

The Superior Die Cutting Co., 127 Bleecker Street, New York, has leased space in the building at Varick and Vandam Streets and will occupy for a new plant.

In connection with an expansion program, the Warren Mfg. Co., Milford, N. J., manufacturer of paper, has awarded contract to the H. K. Ferguson Co., Cleveland, for a one-story addition to be used as a converter unit. It will cost approximately $80,000 with equipment. Other structures now in progress include a two-story machine unit, 81 x 230

The Crane Market

THERE is a fair volume of inquiry for electric overhead cranes but the locomotive crane market continues rather quiet. In overhead equipment the list of 13 cranes for the West Philadelphia plant of the General Electric Co. is still pending and the two 10-ton gantry cranes for the Franklin Lumber Co., Newark, N. J., have not yet been placed.

Among recent purchases are:

Lathrop & Shea, New Haven, Conn., a used 35-ton locomotive crane from a dealer in Boston.

Grasselli Dyestuffs Corporation, Rensselaer, N. Y., five small capacity, single I-beam cranes from a Western builder.

Carnegie Steel Co., Pittsburgh, two 25-ton, 77-ft. span shipping yard cranes for the Homestead works, from the Alliance Machine Co.

Atmospheric Nitrogen Corporation, Syracuse, N. Y., 14 overhead cranes for a plant at Hopewell, Va., including one 50-ton, 66-ft. span with 10-ton auxiliary, one 40-ton, 81-ft. span with 10-ton auxiliary, two 15-ton, 50-ft. span, one 25-ton, 50-ft. span with 5-ton auxiliary and one 20-ton, 85-ft. span electric traveling cranes and eight small capacity hand power cranes, all from unnamed builders.

Subway Engineering Co., Hammond, Ind., a 15-ton, 23-ft. 6-in. span hand power crane from H. D. Conkey & Co.

Ohio Power Co., Thilo, Ohio, a 15-ton, 23-ft. 3-in. span, 3-motor overhead crane from the Milwaukee Electric Crane & Mfg. Corporation.

Watson Co., Chicago, a 2-ton, 60-ft. span electric crane from the Northern Engineering Works.

International Harvester Co., Chicago, a small capacity hand power crane for export, from H. D. Conkey & Co.

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ft., and two-story finishing plant, 80 x 225 ft. The entire program will cost upward of $500,000 with machinery. Headquarters are at 342 Madison Avenue, New York.

The Lidgerwood Mfg. Co., 96 Liberty Street, New York, manufacturer of hoisting engines, etc., is completing the erection of a new plant in the Bayway section, Elizabeth, N. J., and will suspend operations at its Brooklyn plant for early removal of considerable machinery to the new location. It is proposed to discontinue production entirely at the Brooklyn works. The new plant will represent an investment of close to $1,000,000 and will be equipped for all branches of manufacture with the exception of castings, the foundry at 326 Frelinghuysen Avenue, Newark, to be continued in service for the time being. It is understood that later a foundry will be established at the Bayway works and the Newark plant transferred.

The General Pencil Co., 67-69 Fleet Street, Jersey City, N. J., has filed plans for a one-story addition, 50 x 100 ft., to cost about $21,000. George Roth, 578 Summit Avenue, is architect.

The Bakelite Corporation, Perth Amboy, N. J., manufacturer of rubberized products, etc., for electrical, radio and other service, will rebuild the portion of its plant at 350 Rector Street, destroyed by fire Nov. 17, with loss reported upward of $150,000 including equipment. Headquarters are at 247 Park Avenue, New York.

The M. W. Kellogg Co., foot of Danforth Avenue, Jersey City, N. J., manufacturer of tanks and other heavy plate products, piping and pipe fittings, etc., is disposing of a bond issue of $1,000,000, a portion of the fund to be used for expansion. The company has recently perfected a new process for the production of heavy tanks, etc.

Hugh V. Keenan & Co., 29 State Street, Hackensack, N. J., automobile accessories and supplies, have plans for a new three-story service, repair and garage building to cost more than $100,000, with equipment. J. L. T. Tillack, 173 Main Street, is architect.

The Standard Nipple Works, 35 Lewis Street, Newark, N. J., has been formed to manufacture pipe nipples and is in the market for short ends for nipple pipe.

The Ferguson Gear Co., Gastonia, N. C., has opened a new branch office at 77 Cortland Street, New York, to cover territory including New England, New York, New Jersey, Pennsylvania, Delaware and Maryland. The company manufactures cut gears and chain drives.

The American Incinerator Co., Inc., care of Morris & Samuel Meyers, Times Building, New York, has been organized to manufacture and erect incinerating and destructor plants. Contracts have been let for a number of plants upon which work will begin soon.

The Staten Island Shipbuilding Co., Mariners Harbor, N. Y., has formed a division for the manufacture of heat transfer products, to be known as Heat Transfer Products, Inc., which will manufacture water storage heaters, feed water heaters, bleeder heaters, waste heat extractors, preheaters, condensers, evaporators, time coolers, oil heaters and coolers, humidifiers, tanks, piping including bends of all materials, pumps, fabricated plate ware and galvanized products. The products do not represent a new line, but have been manufactured by the Staten Island company for a number of years. The plant is already equipped for the uses of the new company.

The Surface Combustion Co., with executive offices in New York, has removed its business, sales, engineering and research departments to its plant at 1375 Door Street, Toledo, Ohio, where a new factory and office building are being erected. A new branch sales office has been opened at 117 Liberty Street, New York, in charge of Charles A. Blesch.

Philadelphia

PHILADELPHIA, Nov. 21.

THE Central Construction & Supply Co., 2222 Arch Street, Philadelphia, manufacturer of refrigerating machinery and equipment, will soon call for bids for a new three-story plant, to cost more than $80,000 with equipment. Edmund H. Poggi, Broad and Locust Streets, is architect.

The Atlas Conveyor Co., 20 South Fifteenth Street, Philadelphia, recently chartered with a capital of $25,000, will succeed to a company of similar name formed a few months ago to manufacture conveying, elevating and hoisting machinery and parts, and will carry out an expansion program. The company is headed by Percival K. Reed and Leslie G. Weygandt; the last noted is treasurer.

The Delaware Bridge Bus Association and the Association of Motor Bus Owners of Philadelphia and Vicinity, represented by Harold S. Shertz, Liberty Building, Philadelphia, attorney, are completing plans for a new joint terminal and operating building in the city. The new unit will be of multi-story type, with equipment and repair departments, reconditioning division, etc. It is reported to cost close to $2,500,000.

The Pennsylvania Railroad Co., Philadelphia, C. E. Walsh, room 415, 15 North Thirty-second Street, purchasing agent, is asking bids until Nov. 29 for steel transmission towers, contract 125-1927, in connection with the electrification of its local lines.

The United Gas Improvement Co., Broad and Arch Streets, Philadelphia, and the Philadelphia Electric Co., Tenth and Chestnut Streets, have applied to the Pennsylvania Public Service Commission to consolidate their interests. The two companies will have a combined capitalization of more than $200,000,000. The United company has also asked authority to issue 1,859,061 shares of new stock, a portion of the fund to be used for the merger, and for proposed expansion.

The John A. Roebling's Sons Co., South Broad and Canal Streets, Trenton, N. J., manufacturer of wire rope, cables, etc., has awarded a general contract to Hoggson Brothers, 485 Fifth Avenue, New York, for a new building to cost $40,000.

F. W. Tunnell & Co., Inc., 15 North Fifth Street, Philadelphia, manufacturer of fertilizers, etc., has awarded a general contract to the J. S. Rogers Co., Drexel Building, for a one-story addition.

The Fire Ball Mfg. Co., Inc., Lambertville, N. J., recently organized to manufacture a radiant gas water heater, has acquired a local plant and will soon begin production.

The Eastern Alcohol Corporation, 30 Broad Street, New York, is considering plans for the early construction of a new plant unit at Deepwater Point, N. J., for the production of glycerine under a special process, developing as a by-product of ethyl alcohol. It is reported to cost more than $100,000 with equipment. The company is owned and operated jointly by the National Distillers' Products Corporation, address noted, and E. I. du Pont de Nemours & Co., Wilmington, Del.

The Pyrites Co., Ltd., Wilmington, Del., manufacturer of ferric oxide and copper, etc., is said to be planning the

erection of an addition to double approximately the present capacity. It is reported to cost more than $150,000 with machinery.

The School District of Cheltenham Township, Wyncote, Pa., care of David, Dunlap & Barney, 1805 Walnut Street, Philadelphia, architects, contemplates the installation of manual training equipment in a new one and two-story high school to cost $250,000, for which bids are being asked on a general contract until Nov. 29.

The Williamsport Wire Rope Co., Williamsport, Pa., is disposing of a bond issue of $1,600,000, about $600,000 to be used for an addition and the installation of additional machinery.

William Garrison, 274 Wyoming Avenue, West Pittston, Pa., P. O. Pittston, is interested in the purchase of air pressure equipment and systems for water plants in isolated homes, and is desirous of getting in touch with manufacturers.

The McClintic-Marshall Co., Pottstown, Pa., has plans for a one-story addition to its main shop, 120 x 600 ft., to cost more than $250,000 with equipment. Headquarters are in the Oliver Building, Pittsburgh.

The Underwood Elliott-Fisher Co. is being organized with a capital of about 1,000,000 shares of stock to take over and consolidate the Underwood Typewriter Co., New York, with main plant at Hartford, Conn., and the Elliott-Fisher Co., Harrisburg, Pa., manufacturer of bookkeeping and recording machinery and parts, including the Sundstrand Corporation, now a subsidiary of the Elliott-Fisher Co., specializing in the production of adding and calculating machines. An expansion program will be carried out at the Harrisburg plant. John Underwood will be chairman of the board of the consolidated company, and P. D. Wagoner, now president and general manager of the Elliott-Fisher Co., will continue in the same capacity with the new corporation.

The Empire Steel Casting Co., Reading, Pa., recently reorganized, is said to be planning expansion in production at its foundry at Frush Valley for the manufacture of carbon steel castings. Charles S. Payson is chairman of the board of the reorganized company; Frank Hodson is president.

South Atlantic States

BALTIMORE, Nov. 21.

THE Ruud Mfg. Co., Twenty-ninth and Smallman Streets, Pittsburgh, manufacturer of hot water heaters, etc., has leased a portion of the building at 1212 North Charles Street, Baltimore, for a factory branch. A one-story addition is planned.

The School Board of the City of Baltimore, Madison and Lafayette Avenues, has deferred for about a week a general call for bids for its three-story repair and equipment shop, with storage and distributing facilities. The structure will cost more than $50,000 with equipment. William F. Stone, Munsey Building, is architect; Henry Adams, Calvert Building, is mechanical engineer.

The Old Dominion Gas & Electric Co., Hopewell, Va., operated by the Pennsylvania Gas & Electric Corporation, 120 Broadway, New York, is said to be planning the construction of a new artificial gas plant in the vicinity of Hopewell, with steam power department, etc., to cost more than $200,000 with machinery.

The Berliner Aircraft Co., Alexandria, Va., has completed plans for the operation of a local plant for an initial output of about two monoplanes per week.

The Victory Sparkler & Specialty Co., Elkton, Md., operating a complete self-contained unit, including paper tube rolling mill, machine shop, wood-working plant, chemical laboratory, etc., for signal explosives and kindred products, is disposing of a bond issue of $350,000, a portion of the fund to be used for expansion. Branch plants are operated at Mount Holly and Vineland, N. J., and Chestertown, Md.

An automobile service, repair and garage building for company cars, and one-story boiler plant will be erected by the Chevy Chase Dairy Co., Thirty-second and N Streets, N. W., Washington, to cost about $100,000 with equipment. The McCormick Co., 121 South Negley Street, Pittsburgh, is architect and engineer.

The Columbus Electric & Power Co., Columbus, Ga., will issue bonds in amount of $2,000,000, a portion of the proceeds to be used for expansion and betterments. The company has plans for an addition to its hydroelectric generating station at Bartlett's Ferry, to cost more than $750,000 with equipment. Stone & Webster, Inc., 49 Federal Street, Boston, is engineer.

The Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids until Dec. 6 for one motor-driven gear-hobbing machine for the Puget Sound Navy Yard, schedule 8090; also for a quantity of anchor shackles for Eastern and Western yards, schedule 8095; and for 500 boiler stay tubes, for Mare Island, schedule 8085.

Union Brothers, 37 West Cross Street, Baltimore, manufacturers of furniture, have plans for a three-story addition, totaling about 30,000 sq. ft. of floor space, to cost more than $65,000 with equipment. It is also planned to establish a new branch plant on site to be selected. Benjamin Frank, 517 North Charles Street, is architect.

The North American Cement Corporation, Citizens' National Bank Building, Baltimore, with headquarters at 126 State Street, Albany, N. Y., will proceed with an expansion program at its mill at Security, near Hagerstown, Md., operated in the name of the Security Lime & Cement Co., recently acquired, to cost more than $600,000 with machinery. Contracts for power equipment are being let and awards for other machinery will soon be placed.

The Gulf Anthracite Coal Co., Gulf, N. C., is planning for the development of its local coal properties, aggregating about 1500 acres, and will install mining machinery, hoisting and power equipment.

H. H. Jennings, care of the Factory Buildings Corporation, Winchester, Va., and associates are completing plans for the erection of a new local plant by the company noted, to be occupied under lease for a furniture factory and to be completed in about 60 days. It is purposed to expend about $50,000 for machinery and power equipment. H. B. McCormack, head of the Factory Buildings Corporation, is interested in the project. A company will be organized to operate the plant.

The Savannah Electric & Power Co., Savannah, Ga., is planning for a new stock issue to total about 250,000 shares, a portion of the proceeds to be used for expansion.

The Board of Trustees, State Agricultural College, Atlanta, Ga., is considering the installation of a new steam power plant to cost about $35,000.

Stephenson & Taylor, Arcade Building, Norfolk, Va., have acquired property on the Virginia Beach Boulevard and are considering the early construction of a one-story plant for the production of wooden containers and packages, to cost close to $25,000 with equipment.

The Gathmann Engineering Co., Baltimore, has moved from the Garrett Building to 4720 Edmondson Avenue, Hunting Ridge, Baltimore.

Buffalo

BUFFALO, Nov. 21.

THE United States Hoffman Machinery Corporation, 629 Temple Street, Syracuse, N. Y., is said to have plans for a one-story addition to cost more than $25,000.

The Ohio Brass Co., Mansfield, Ohio, manufacturer of electric traction and coal-mining equipment, etc., is said to be concluding negotiations for the purchase of the Locke Insulator Corporation, Victor, N. Y., with branch plant at Baltimore, manufacturer of high voltage insulators, etc. The Locke company has assets at both plants estimated at $3,500,000. The purchasing company purposes to continue the acquired interest as a subsidiary.

The Hewitt Rubber Co., 240 Kensington Avenue, Buffalo, has changed its name to the Hewitt-Gutta Percha Rubber Corporation, following out its purchase several months ago of the Gutta Percha & Rubber Mfg. Co., Brooklyn, N. Y. The business of the latter company has been removed to the Buffalo works where production will be concentrated in the future. The Hewitt company has disposed of the tire-manufacturing division of its business and will use the portion of the plant previously devoted to this line for the production of conveyor belting and kindred mechanical rubber specialties; additional equipment is being installed. The consolidated organization is controlled by the Robins Conveying Belt Co., 15 Park Row, New York, and will furnish considerable of the production requirements of that company.

The Linde Air Products Co., 30 East Forty-second Street, New York, manufacturer of industrial oxygen, welding apparatus, etc., is said to have plans for a new plant at Erie, Pa., to cost in excess of $100,000 with equipment.

The Fire Marine Equipment Corporation, Clayton, N. Y., manufacturer of marine fire fighting machinery, chemical apparatus and the Volunteer Pumper is being dissolved, and in future the pumper and chemical apparatus will be manufactured in Watertown and the marine equipment at Clayton, as heretofore.

The Gould Car Lighting Co., Rochester, N. Y., which is controlled by the Gould Coupler Co., has been sold to the Simplex Equipment Co., New York, and the plant of the car lighting company on Lexington Avenue, Rochester, will be used for the manufacture of loud speakers and other radio equipment. The sale does not include the plant itself but only the patents, patterns and machinery.

New England

BOSTON, Nov. 21.

THE machine tool market shows more life, according to sales reported for the past week, although it is still far from active. It is generally believed, however, that the improvement is temporary and that the next real buying movement will not take place much before the middle of January. The Pratt & Whitney Aircraft Co., Hartford, Conn., has purchased eight or ten machines, mostly drilling and grinding equipment This company recently received an order for close to $4,000,000 from the United States Navy, and the plant is operating at capacity. Other sales included a used No. 3 Cincinnati milling machine to a Rhode Island shop, a used 16-in. x 8-ft. lathe to a Cambridge shop, considerable hoisting and conveying equipment for various Vermont points, and a number of small lathes, drilling tools, presses and grinding machines to Massachusetts and Maine plants. The Boston Elevated Railway is about to close on an upright drill and the General Electric Co., Lynn, Mass., on a saw grinder. New inquiries are scarce and all are for single machines.

The Vermont industrial situation is still very bad as a result of the recent flood. Most of the railroads operating in that State are maintaining certain train schedules, consequently raw materials and finished products have a freer movement. Another month should see manufacturing back on nearly normal schedules. The National Acme Co., Windsor, Vt., puts its flood loss at $75,000; the Cone Automatic Machine Co., Windsor, at $3,000; the Windsor Foundry, Windsor, at $5,000; the Fellows Gear Shaper, Springfield, Vt., at $15,000, and the Seward Automatic Electric Co., White River Junction, at $20,000.

Control of the Cheney D. Bigelow Wire Works, Springfield, Mass., has passed to a new company, the Cheney Bigelow Wire Works, of which W. Bruce Pirnie, president W. C. Simons, Inc., Springfield, is chairman of the board, Leroy D. Bartlett, president; W. B. Sheehan, treasurer, and John Mitchell, clerk. These officers and H. H. Bowman, Dr. Edward G. Gilbert and Andrew J. Tucker, retiring president of the old company, constitute the board of directors. The new company's capitalization consists of 20,000 shares of no par value common and 12,500 shares of cumulative participating preferred stock, all of which are outstanding. The original business was established in 1842 by Cheney Bigelow.

Permit has been granted Frank G. Volpe, Hager Street, Arlington, Mass., to build a one-story, 50 x 108 ft., laundry and machine shop at Somerville, Mass. Plans are private.

The Funk & Wilcox Co., 26 Pemberton Square, Boston, architect, is taking bids on a one-story, 60 x 190 ft. artificial ice plant at South Lawrence, for Bernard L. McDonald, 398 Essex Street, Lawrence, Mass. Miscellaneous equipment is required.

The M. J. Whittall Associates, Brussels Street, Worcester, Mass., has started work on a two-story, 60 x 220 ft., machine shop. J. D. Leland & Co., 20 Providence Street, Boston, drew the plans.

Plans are nearing completion for a three and six-story, 143 x 238 ft., technical high school at Fall River, Mass., to cost $1,000,000. It will contain four shops. E. M. Corbett, 70 Bedford Street, Fall River, is the architect.

The Board of Contract and Supply, Providence, R. I., has awarded a general contract for a new junior high school to contain six shops. The school and equipment will cost more than $1,200,000.

The Wallace Barnes Co., Bristol, Conn., springs, has moved its screw machine department to the former Garrigus Machine Co. plant, Riverside Avenue. The department is operating day and night with many employees on overtime.

The Brier Mfg. Co., 70 Ship Street, Providence, R. I., manufacturer of jewelry specialties, plated goods, etc., has plans for a three-story and basement factory, totaling about 60,000 sq. ft. of floor space, to cost in excess of $80,000 with equipment. Frank B. Perry, 44 Franklin Street, is architect.

The Nash Automobile Agency, 747 Main Street, Worcester, Mass., has plans for a new service, repair and garage building, to cost close to $100,000 with equipment. Frost, Chamberlain & Edwards, 390 Main Street, are architects.

The New Haven Clock Co., New Haven, Conn., has awarded a general contract to Frank Tagliatela, 140 Blatchley Avenue, for a one-story addition, 40 x 80 ft.

The Norfolk Woodworking Co., Inc., 275 Hancock Street, Quincy, Mass., has filed plans for a one-story addition, 70 x 300 ft., and 60 x 128 ft., to cost upward of $50,000 with equipment. L. S. Joslin, 339 Newbury Street, Boston, is architect.

The Nash Engineering Co., South Norwalk, Conn., manufacturer of compressors, pumps, etc., is contemplating the erection of a one-story addition on adjoining property recently acquired, for the production of special machinery for paper mills.

The Connecticut Light & Power Co., Waterbury, Conn., is arranging for a preferred stock issue to total $15,000,000, a portion of the fund to be used for extensions and improvements.

The Edison Electric Illuminating Co., 39 Boylston Street, Boston, has asked bids on revised plans for a one-story power substation at Roxbury, 45 x 75 ft., to cost upward of $75,000 with equipment. Bigelow & Wadsworth, 120 Tremont Street, Boston, are architects.

The Johnson Steel & Wire Co., 50 Wiser Avenue, Worcester, Mass., has awarded a general contract to I. R. Petterson, Worcester, for extensions and improvements to cost approximately $17,000.

George Long, president of the Long Lock Co., Hartford, Conn., has perfected a new automatic key-making machine and will devote a portion of the plant for production of the new unit.

The Aberthaw Co., Boston, has been awarded contract for the erection of a two-story and basement warehouse, 132 x 336 ft., at Worcester, Mass., for the Melville Shoe Corporation.

Chicago

CHICAGO, Nov. 21.

ORDERS for machine tools are spotty, but in the aggregate represent a fair volume of business. November sales show a drop from October, which with some sellers was the second best month of the year. If inquiry can be taken as an index, however, dealers believe that this month will average well up to expectations for this time of year. There are no individual sales of note, other than those of the Nash Motors Co. for its Racine plant. The International Harvester Co. is buying several items of tool room equipment for its Deering (Chicago) works. The railroads, having obtained prices for budget purposes, are showing no interest in the market.

Swift & Co., Union Stock Yards, Chicago, are planning the construction of a one-story cold storage and refrigerating plant at Altamount, Ill.

The Sanitary District of Chicago, 910 South Michigan Avenue, Chicago, will take bids until Dec. 1 for the North branch sewage pumping station.

The Mail Tool Co., 7740 South Chicago Avenue, Chicago, has plans for a one and two-story plant addition, to cost about $30,000 with equipment. It is expected to begin work after the first of the year. Buckley & Skidmore, First Trust & Savings Bank Building, are architects.

Rossbach & Sons, 520 Sherman Street, Chicago, operating an iron and metal-working plant, are completing plans for a new one-story works, 78 x 98 ft., to cost approximately $45,000.

The Northwestern Paper Co., Cloquet, Minn., has plans for a new group of buildings, to be two and three stories, to cost in excess of $750,000 with machinery. The Jacobson Engineering Co., Plymouth Building, Minneapolis, Minn., is engineer.

The Montana Cities Gas Co., Great Falls, Mont., recently organized, plans the early construction of a pipe line with compressor stations from the Shelby gas field, near Shelby, Mont., to Great Falls and vicinity, about 100 miles. The company will furnish the requirements of the Great Falls Gas Co. A bond issue of $1,500,000 has been arranged, the fund to be used in part for the construction.

The Mutual Bear Creek Coal Co., Bear Creek, Mont., is considering rebuilding the portion of its tipple and power plant recently destroyed by fire, with loss of $50,000, including equipment.

The Oelwein Chemical Co., Oelwein, Iowa, will soon take bids for a new four-story plant, to cost more than $60,000 with equipment. R. F. Moore, Merchants' National Bank Building, Cedar Rapids, Iowa, is architect.

The Precision Metal Workers, 3100 Carroll Avenue, Chicago, has superstructure under way on a one-story and basement addition to cost about $25,000. F. E. Davidson, 53 West Jackson Boulevard, is architect.

The H. H. Slingerland Mfg. Co., 1815 Orchard Street, Chicago, manufacturer of musical instruments, has purchased the former factory of the Brockman Furniture Co., comprising two two-story units, on site 125 x 125 ft., and

will occupy for increased capacity. Production will be concentrated at the new location.

The Advance Pattern & Foundry Co., 2734 West Thirty-sixth Place, Chicago, will take bids on a general contract for a one-story addition to cost upward of $150,000 with equipment. A. A. Wickland & Co., 59 East Madison Street, are architects and engineers.

The Massey Concrete Products Co., 2429 Broadway, N. E., Minneapolis, Minn., manufacturer of cast concrete tanks and kindred products, has filed plans for a new one-story plant, 75 x 300 ft., to replace the portion of its works recently destroyed by fire. It is reported to cost more than $60,000 with equipment. Headquarters are at 122 South Michigan Avenue, Chicago.

The Hudson Metal Products Co., Chicago, operated by J. C. Spengler & Son, 2322 Milwaukee Avenue, will soon begin the erection of a new one-story plant, 80 x 125 ft., to cost about $45,000 with equipment. A. E. Stroebel, 53 West Jackson Boulevard, is architect.

Van Gunten & Van Gunten, 26 East Huron Street, Chicago, architects, have asked bids on a general contract for a two-story automobile service, repair and garage building, to cost about $100,000 with equipment.

The Herman Nelson Corporation, Moline, Ill., manufacturer of ventilating and heating units, will spend $150,000 within the next few months on factory buildings to unite its plants in Moline. Two buildings are scheduled for early construction, one two stories, 60 x 120 ft., and the other one story, 120 x 140 ft.

Cincinnati

CINCINNATI, Nov. 21.

MACHINE tool trade continues spotty. Buyers are confining purchases to tools for replacement purposes and are even postponing the placing of these orders until absolutely necessary. This conservative policy extends without exception into all consuming industries and local builders are of the belief that bookings during the remainder of the year will be light. The Norfolk & Western Railroad, which recently received bids on a list of 104 tools, will not close for its requirements until some time in December. A company in this district has received foreign orders for three steam hammers and has sold a drum-type milling machine to the Ford Motor Co. A railroad in the Chicago territory has bought a multiple-spindle drilling machine.

The D. L. Auld Co., Sixth Avenue, Columbus, Ohio, manufacturer of metal name plates and kindred metal goods, has filed plans for a one-story addition to cost in excess of $20,000 with equipment. H. E. Eiselt, 297 South High Street, is architect.

The Kelly-Springfield Truck & Bus Corporation, Springfield, Ohio, has placed its local plant on the market, consisting of a group of buildings with approximately 225,000 sq. ft. of floor space on a 6-acre tract.

The Inland Mfg. Co., Coleman Avenue, Dayton, Ohio, manufacturer of locking devices for automobile steering wheels and kindred products, has filed plans for a one-story addition to its power plant to cost close to $25,000.

The City Council, Cookeville, Tenn., has plans under way for an addition to its municipal hydroelectric power house, to cost close to $150,000 with equipment. J. A. Switzer, Knoxville, Tenn., is engineer.

The Kentucky Oxygen-Hydrogen Co., Logan and Goss Streets, Louisville, manufacturer of commercial oxygen, hydrogen, etc., has plans for a new plant at Nashville, Tenn., to cost more than $100,000 with equipment. Frank C. Lane, Cornell Place, Nashville, is architect and engineer.

The Board of Education, Jackson, Ohio, contemplates the installation of manual training equipment in a two-story high school to cost about $250,000, for which plans are in preparation.

The Air Corps, Material Division, Wright Field, Dayton, Ohio, is asking bids until Dec. 1 for 130 propeller assemblies and for 150 and 170 such assemblies under an alternate proposal; also for 80 split hub propeller blades, circular 144; until Nov. 30 for 10 radiator assemblies, circular 143.

The Davidson County Highway Commission, Nashville, Tenn., F. M. Dorris, chairman, is asking bids on a general contract for an automobile service building and garage, with machine and repair shop, for County automobiles, to cost more than $115,000 with equipment. Asmus & Clark, Stahlman Building, are architects.

The Columbia Gas & Electric Co., Cincinnati, is concluding arrangements for a merger with the Central Kentucky Natural Gas Co., Lexington, Ky., the latter to be operated as a subsidiary organization. The Columbia company plans expansion on the natural gas properties in the blue grass district of Kentucky, including pipe lines, compressor stations, etc. The first noted company has also acquired the artificial and natural gas properties of the Cities Service Co., at Toledo, Sandusky, Mansfield, Ohio, and neighboring sections, and plans expansion.

The Wilson-Weesner-Wilkinson Co., Knoxville, Tenn., has been made distributer in adjacent territory of the Securitory open flooring and electro-forged grating and steps made by the Blaw-Knox Co., Pittsburgh.

Pittsburgh

PITTSBURGH, Nov. 21.

INQUIRIES for machine tools appear to be a little more frequent than recently, but the report of actual sales still is unfavorable, probably due to the proximity of the end of the year.

The Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, is said to be completing arrangements for the purchase of about 30 acres at Los Angeles as site for a new Pacific Coast plant, to cost more than $2,500,000 with machinery. It is understood that plans will be drawn for initial units in about 90 days.

The Fuller Label & Box Co., 444 Dargin Street, Pittsburgh, has plans for a three-story addition, to cost upward of $50,000 with machinery.

The Beaver Falls Art Tile Co., Beaver Falls, Pa., a unit of the recently organized Rossman Corporation, will rebuild the portion of its plant destroyed by fire Nov. 16, with loss reported in excess of $100,000 including equipment.

The Fokker Aircraft Corporation, 110 East Forty-second Street, New York, is disposing of an issue of preferred stock to provide funds for a new plant in the vicinity of Glendale, near Wheeling, W. Va., to cost more than $400,000 with equipment. A considerable portion of the works will be given over to assembling.

The Fostoria Glass Co., Moundsville, W. Va., is planning the erection of an addition, to cost about $100,000 with machinery.

J. W. Simpson, Parnassus, Pa., will rebuild the portion of his two-story automobile body and carriage works destroyed by fire Nov. 14, with loss reported at $18,000 including equipment.

The Harbison-Walker Refractories Co., Pittsburgh, has let contracts for the erection of four direct-fired tunnel kilns to William Swindell & Brothers, Pittsburgh. Two kilns will be erected at the company's Templeton, Pa., plant and two at Clearfield, Pa., each to have a daily capacity of 35,000 9-in. brick.

Detroit

DETROIT, Nov. 21.

THE Sanitarium & Hospital Equipment Co., Battle Creek, Mich., manufacturer of metal furniture, etc., has superstructure under way on a two-story and basement addition, 145 x 310 ft., to cost in excess of $125,000 with equipment. M. J. Morehouse, 343 South Dearborn Street, Chicago, is architect.

The Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has filed plans for an addition to its power house to cost more than $75,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

The Detroit Garages, Inc., 510 Cass Avenue, Detroit, Horace Peabody, head, is considering the erection of a ten-story service, repair and garage building, to cost close to $500,000 with equipment.

The Board of Education, Pontiac, Mich., contemplates the construction of a central power house on the high school campus, to cost close to $150,000 with equipment. James H. Harris is superintendent.

The Port Huron Sulphite & Paper Co., Richardson Avenue, Port Huron, Mich., is said to be considering the erection of a one-story addition to cost upward of $75,000 with equipment.

The Hess Aircraft Co., Wyandotte, Mich., is reported to have concluded arrangements with the Chamber of Commerce, Alliance, Ohio, for a new airplane manufacturing plant at that place. The present works will be removed to the new location later.

The plant and property of the Rickenbacker Motor Co., Cabot Street, Detroit, will be offered at a public sale by the Security Trust Co., receiver, on Nov. 28, including both No. 1

and No. 2 works, with two parcels of real estate and a quantity of machine tools and other equipment.

The American Laundry Co., 634 Division Street, Grand Rapids, Mich., has completed plans for a two-story power house, to cost close to $100,000 with equipment. Turner & Thebaud, Grand Rapids, are architects.

Ovens, power equipment, conveying and other machinery will be installed in the plant to be erected at Grand Rapids, Mich., by the B. H. Kroger Grocery & Baking Co., 817 Main Street, Cincinnati, to cost close to $110,000. Newton Tebow, 540 Main Street, Cincinnati, is engineer.

The Decker Screw Products Co., Albion, Mich., has been organized to manufacture special automatic screw machine parts milled from bar steel. It has contracts from a number of automotive companies and is in the market for materials used in the manufacture of screw machine products, as well as for machinery and equipment.

The John D. Stanton Steel Co., Iron and Wight Streets, Detroit, has been organized to conduct a sheet and strip steel warehouse, dealing in both prime and secondary materials direct from mills.

The Wesson Sales Co., 7338 Woodward Avenue, Detroit, representing in that city the Eclipse Interchangeable Counterbore Co. and John Bath & Co., Inc., has removed its offices to larger quarters in the same building.

Gulf States

BIRMINGHAM, Nov. 21.

THE Prather-Cadillac Co., Dallas, Tex., local representative for the Cadillac automobile, has completed plans for a one-story service, repair and showroom building, 220 x 250 ft., to cost approximately $100,000 with equipment.

The Polk County Board of Public Instruction Co., Bartow, Fla., is considering the installation of manual training equipment in a new high school to cost $200,000, for which plans will be drawn by E. R. James, Bartow, architect.

The Houston Natural Gas Co., Houston, Tex., is said to be planning the installation of a system for domestic supply, with compressor station and auxiliary equipment, to cost close to $100,000.

The Southern Paper Co., Moss Point, Miss., has work in progress on an expansion and improvement program at its mill, to cost close to $250,000 with machinery.

Alfred A. Finn, Bankers' Mortgage Building, Houston, Tex., architect, has plans for a three-story automobile service, repair and garage building, 100 x 150 ft., to cost approximately $125,000 with equipment.

The Independent School District, Corpus Christi, Tex., plans the installation of manual training equipment in a new junior high school to cost $250,000, for which plans will be drawn by Hardy & Curran, Nixon Building, architects.

The South End Ice Co., 902 Hogan Street, Houston, Tex., will soon begin the erection of a one-story addition to cost close to $27,000 with machinery.

The Houston Pipe Line Co., Petroleum Building, Houston, Tex., is reported to be planning the construction of a pipe line for natural gas transmission from a point near Freeport, Tex., to the vicinity of Bay City, Tex., to cost more than $400,000.

The Standard Motor Equipment Corporation, Barnett Bank Building, Jacksonville, Fla., C. B. Lozier, president, has plans for the erection of a local plant for the manufacture of spark plugs and kindred automotive equipment, with initial unit to cost more than $30,000 with equipment.

Eugene Sykes, Aberdeen, Miss., and associates are completing plans for the construction of a one-story ice-manufacturing plant, 75 x 250 ft., to cost more than $65,000 with equipment. The installation of Diesel oil-engine equipment is under consideration.

The Koeneman Electric Co., 125 South State Street, Jackson, Miss., has plans for a one-story factory to cost about $21,000 with equipment. Claude H. Lindsley, Lamar Life Building, is architect.

The Tulane Ice Co., New Orleans, has plans for a new one-story plant. Favrot & Livaudais, Hibernia Building, are architects.

The McWane Cast Iron Pipe Co., Birmingham, has work nearing completion on a new unit at its local foundry, and purposes to have the structure ready for service by the first of the year. The installation will provide for casting pipe up to 12 in. diameter under a mechanical process.

The Marshall Wood Products Co., Marshall, Tex., has arranged for an increase in capital from $50,000 to $100,000, a portion of the fund to be used for expansion.

The Galvanizing & Plating Co. of Texas has been organized and incorporated for $50,000. The officers are: C. A. Mattiza, president and treasurer; R. M. Carney, vice-president and general manager; Robert L. Sonfield, secretary. A plant is under construction at 3205 Engelke Street at Navigation Boulevard, Houston, Tex. It will be equipped to do all kinds of jobbing work in hot dip galvanizing and tin plating.

Ernest Cotton, Miami, Fla., director of public service, is completing plans for the construction of the first unit of a municipal automobile service, repair and garage building, to cost close to $70,000 including equipment. It is purposed to construct an additional unit later.

The Blake Coal & Ice Co., Columbus, Ga., J. P. Blake, head, is completing plans for the construction of a one-story ice-manufacturing plant 35 x 58 ft., to cost more than $25,000 with electrically-operated equipment.

The Yaeger Sheet Metal & Roofing Co., Inc., 240 Southwest North River Drive, Miami, Fla., has been organized to operate an architectural and marine sheet metal works. The company will not build a new plant, but is in the market for materials and will do contract work in its own shop.

James A. Hall, 1525 Esperson Building, Houston, Tex., has been appointed distributer for Security open flooring, electroforged grating and steps manufactured by the Blaw-Knox Co., Pittsburgh.

Cleveland

CLEVELAND, Nov. 21.

MACHINE tool business in this territory in November will show quite a little gain over October. Some business in lots of two or three machines, which had been pending for several weeks, has been closed within the past few days and there is a moderate demand for single machines. Inquiry is slightly better for some lines. A local lathe manufacturer the past week took two orders from the East, each for three large turret lathes. The automotive industry is generally quiet, although some machine tool business has come recently from a company which will make parts for Ford cars. Railroads in this territory are not expected to buy any additional machinery equipment this year.

The Sunlight Electric Mfg. Co., Dana Avenue and Vine Street, Warren, Ohio, is considering plans for extensions and improvements in its electric lamp manufacturing plant, to cost close to $100,000 with equipment.

The Mather Auto Service Co., South Freedom Street, Alliance, Ohio, has awarded a general contract to the A. D. Spies Co., Alliance, for a three-story service, repair and garage building, to cost approximately $100,000 with equipment.

The plant of the Canton Steel Foundry Co., Allen Avenue and Fifteenth Street, S. E., Canton, Ohio, will be offered at a public sale on Nov. 29, including land and buildings and complete machinery. The company was recently declared bankrupt.

The Everhard Mfg. Co., Seventh Street, S. W., Canton, Ohio, manufacturer of door and window screens, etc., is completing plans for a one-story and basement addition, 75 x 102 ft., to cost more than $30,000.

The Ohio Power Co., Canton, Ohio, is disposing of a bond issue of $9,072,000, a portion of the proceeds to be used for extensions and improvements, including transmission line construction.

The Linde Air Products Co., 30 East Forty-second Street, New York, manufacturer of industrial oxygen, etc., is reported to have plans maturing for a new plant at Canton, to cost about $125,000 with equipment.

The American Steel & Wire Co., Rockefeller Building, Cleveland, is said to have plans under way for three one-story additions to its plant on East Twenty-ninth Street, 70 x 485 ft., and two, 25 x 70 ft., to cost more than $450,000 with equipment.

Milwaukee

MILWAUKEE, Nov. 21.

PRACTICALLY all machine tool buying is for replacement needs, with the majority of orders calling for single machines. Demand for equipment from the automotive industries is slack, and the market is depending upon miscellaneous industries for its main support. Industrial employment is larger than a year ago, but has been declining somewhat. There is little demand for skilled workers in the foundries and machine shops, such as there was in the early and middle months of the year.

The Stott Briquette Co., St. Paul, Minn., has leased property at Twenty-seventh and Canal Streets, Milwaukee, from the Great Lakes Coal & Dock Co., with a view of establishing a plant costing about $300,000 for the manu-

facture of coal briquettes. The Stott company at present operates a plant at Superior, Wis.

Frank Mainwaring, proprietor of a machine shop at Gotham, Richland County, Wis., is preparing to rebuild the structure which was almost totally destroyed by fire on Nov. 13. The loss is estimated at $12,000.

The Wisconsin Telephone Co., 418 Broadway, Milwaukee, is awarding contracts for a local branch warehouse, storage and service plant, 60 x 190 ft., costing $50,000. The architects are Herbst & Kuenzli, 130 Wisconsin Avenue, local.

The Beaver Dam Pattern Co., Beaver Dam., Wis., has been organized by E. J. Beers, J. J. Kumba and F. P. Bartell to engage in the manufacture of metal and wood patterns, templates, etc. A shop has been established.

The Stanek Tool & Mfg. Co., 966 Thirtieth Street, Milwaukee, has increased its capitalization from $20,000 to $35,000 in contemplation of the early enlargement of its plant and equipment. Edward J. Stanek is president and general manager.

The Modern Machine Works, 190-192 Milwaukee Street, Milwaukee, has been incorporated as the Modern Machine Works, Inc., with a capital stock of $50,000. The ownership is unchanged, being vested principally in Paul F. Saager, Harold C. Hansen and Ralph R. Luebke. The company is enlarging its facilities for production jobbing, hardening and grinding work and general metal products manufacture.

Charles D. Haven, 428 Newton Avenue, Milwaukee, who has been associated for several years with the Vilter Mfg. Co., refrigerating machinery, Milwaukee, has organized the Haven Mfg. Co., with authority to manufacture refrigerating machinery, engines, boilers, motors, etc. Definite plans have not been made public as yet.

The Worden-Allen Co., Milwaukee, has been appointed distributer in that territory of the Security open flooring and electroforged grating and steps manufactured by the Blaw-Knox Co., Pittsburgh.

St. Louis

ST. LOUIS, Nov. 21.

THE National Ammonia Co., 3600 North Broadway, St. Louis, has asked bids on a general contract for a one-story addition, 75 x 150 ft., including improvements in present factory, to cost close to $40,000. J. C. Atwood is secretary and treasurer. Klipstein & Rathman, 316 North Eighteenth Street, are architects.

The N. O. Nelson Mfg. Co., 928 Chestnut Street, St. Louis, manufacturer of plumbing equipment and supplies, is reported to be considering the erection of a new plant, to cost more than $200,000 with equipment. It is understood that the project will mature early in the new year.

The Empire Gas & Fuel Co., 60 Wall Street, New York, an interest of Henry L. Doherty & Co., operating the Empire Oil & Refining Co. and other properties in Missouri, Oklahoma and Kansas, has disposed of a preferred stock issue of $10,000,000, a portion of the proceeds to be used for expansion.

The International Harvester Co., 109 North Kansas Avenue, Topeka, Kan., has filed plans for a one-story factory branch and distributing plant, 100 x 153 ft., to cost upward of $75,000 with equipment. Headquarters are at Chicago.

The Missouri Power & Light Co., Jefferson, Mo., has approved plans for extensions and betterments in its steam-operated electric power plant to double, approximately, the present capacity, to cost more than $150,000.

The Crane Co., 836 South Michigan Avenue, Chicago, has awarded a general contract to the Blaser-Vollmer Construction Co., Wichita, Kan., for its one and two-story and basement factory branch and distributing plant at Wichita, 150 x 150 ft., to cost about $100,000 with equipment. Schmidt, Boucher & Overend, Fourth National Bank Building, Wichita, are architects.

The Board of City Commissioners, Eldorado, Okla., will soon take bids for equipment for a proposed municipal waterworks and sewage system, including 50,000-gal. capacity steel tank on steel tower, water-softening plant, etc. The entire project will cost $110,000. The Benham Engineering Co., Gumbel Building, Kansas City, Mo., is consulting engineer.

George F. Carraher, 746 Heman Street, University City, Mo., is considering the erection of a one-story sheet-metal working plant at the rear of 4237 Olive Street, St. Louis, to cost close to $20,000 with equipment.

The American Natural Gas Corporation, Tulsa, Okla., operating natural gas properties and systems in Oklahoma, Kansas and Texas, with more than 2200 miles of pipe lines, is disposing of a preferred stock issue to aggregate $4,975,000, a portion of the fund to be used for expansion and improvements.

The Sheffield Steel Corporation, Kansas City, Mo., has broken ground at Oklahoma City, Okla., for the first unit of its new plant and warehouse.

The Union Wire Rope Co., 720 Kennedy Building, Tulsa, Okla., has been formed to take over the plant and assets of the Black Steel & Wire Co., Kansas City, Mo. The new company has made a sales contract with the Jarecki Mfg. Co., Erie, Pa., to handle its products in the Mid-continent and Eastern oil fields, and the Pacific Coast business will be handled by R. H. Keith.

Indiana

INDIANAPOLIS, Nov. 21.

PLANS are being completed by the Woodward Engineering Co., Fort Wayne, Ind., manufacturer of mechanical equipment, for a new one-story plant, 100 x 300 ft., to cost $65,000 with equipment.

The Parts Corporation 733 Virginia Avenue, Indianapolis, manufacturer of automobile parts, will take bids in December for a two-story addition, to cost about $55,000 with machinery. Foltz, Osler & Thompson, J. F. Wild Building, are architects. B. F. Kelly is president.

The Auburn Automobile Co., Auburn, Ind., has work under way on a one-story addition, totaling about 50,000 sq. ft. of floor space, for general service and parts division. It will cost approximately $70,000 with equipment.

The City Council, Huntington, Ind., is considering extensions and improvements in the municipal electric light and power plant, to cost about $60,000 with equipment. Harry O. Garman, Knights of Pythias Building, Indianapolis, is consulting engineer.

The Fisher Brothers Paper Co., 120 West Columbia Street, Fort Wayne, Ind., has plans for a three-story addition, 40 x 150 ft., to cost about $55,000. A. M. Strauss, Cal-Wayne Building, is architect.

Jacobs & Co., Inc., 631 South Delaware Street, Indianapolis, manufacturer of metal and wood patterns, etc., has awarded a general contract to Mount Brothers, 812 South Roena Street, for two one-story additions, 60 x 90 ft., and 25 x 60 ft.

The Board of Education, Elkhart, Ind., has asked bids on a general contract for a two-story vocational school to cost $100,000. Hubert & Miller, Monger Building, are architects.

Fire, Nov. 12, destroyed coal chutes and coal-handling equipment at the shops of the Chicago, Indianapolis & Louisville Railroad (Monon Route), Lafayette, Ind., with loss estimated at $25,000.

The Merz Engineering Co., Indianapolis, recently organized by Charles C. Merz, Fred Moskovics, president Stutz Motor Car Co., North Capitol Avenue, and associates, is arranging for the establishment of a local plant for the manufacture of aircraft motors. The company has acquired at a receiver's sale considerable equipment formerly used by the H. C. S. Motor Car Co., Indianapolis, bankrupt, and has taken over a portion of the former plant of the H. C. S. Cab Co., North Capitol Avenue, for housing the equipment and for possible initial works. The new plant will consist of a machine and assembling department, testing department, parts division and engineering department. Mr. Merz will head the new company. Douglas Wheeler, president Wheeler-Schebler Carburetor Co., 1302 Barth Avenue, is also interested in the new enterprise.

The Fisher Electrical Co., 1740 Lafayette Street, Fort Wayne, Ind., has arranged for the erection of a new one-story plant to be occupied under lease, to cost in excess of $50,000 with equipment.

The Poster Parts Co., Terre Haute, has been organized to manufacture mechanical equipment and supplies for outdoor advertising. The company is already in operation, manufacturing both by contract and in its own plant.

The Warner Corporation, Muncie, Ind., has awarded contract for a machine shop addition of approximately 26,000 sq. ft. of floor space.

Pacific Coast

SAN FRANCISCO, Nov. 16.

BIDS will soon be asked by the Sterling Electric Motors, Inc., 124 West Fourth Street, Los Angeles, manufacturer of motors and other electrical equipment, for the first unit of a new plant, 100 x 100 ft., to cost upward of $75,000 with equipment. Charles F. Plummer, Story Building, is architect.

The City Council, Napa, Cal., has plans for a municipal electric light and power plant, to cost more than $50,000 with equipment.

The B. & H. Moulding Co., Stockton, Cal., has concluded arrangements for the acquisition of the plant former-

ly occupied by the California Siding Co., and will equip for a new mill. The B. & H. company was formed recently with a capital of $50,000.

The Board of Education, Alhambra, Cal., has plans for a new vocational shop, 50 x 75 ft., at the local high school. Quintin & Kerr, Weber Building, are architects.

C. S. Freeman, 4259 South Normandie Avenue, Los Angeles, and J. H. Knapp, Helena, Cal., have secured a permit for a hydroelectric power development on the Trinity River, Trinity County, near Helena, to consist of three power stations to develop capacities of 54,400 hp., 13,500 hp. and 3841 hp., respectively. A transmission line will be constructed. The entire project will cost close to $15,000,000. Construction will begin before the close of the year.

Swift & Co., Chicago, will erect a new cold storage and refrigerating plant at Globe, Ariz., reported to cost close to $28,000 with equipment.

School District No. 1, Central Building, Seattle, is said to be planning the installation of manual training equipment in an addition to the Queen Anne High School, to cost $300,000, for which plans will be drawn by F. A. Naramore, 810 Dexter Avenue, architect.

The City Council, Idaho Falls, Idaho, contemplates the construction of a new auxiliary municipal hydroelectric power plant, to cost $100,000 with equipment. A transmission line will be built.

The Portland Electric Power Co., Portland, has acquired about 1½ acres at Salem, Ore., as a site for a new storage and distributing plant, with repair department. A monorail crane will be installed.

The Pacific Gear & Tool Works, 1035 Folsom Street, San Francisco, is said to be planning the construction of a new one-story plant.

The Hamma Hamma Power & Paper Co., Olympia, Wash., Elbert M. Chandler, president, has applied for permission to use water from the Hamma Hamma River for a hydroelectric power project to develop 19,000 hp., and to cost close to $500,000. A transmission line is planned.

The Oregon City Foundry Co., Oregon City, Ore., whose plant was recently destroyed by fire, is arranging to get into operation again. A brick structure, 33 x 90 ft. with ell, 24 x 50 ft., on Fourth and Main Streets has been purchased to house the machine and pattern shop. A building will be erected on the site of the former plant which is expected to be ready for operation before the first of the year.

The City Council, Salem, Ore., has awarded to the Pittsburgh-Des Moines Steel Co. contract for the construction of an incinerator to cost $34,995.

Albert E. Abbott, proprietor of the Power City Machine Shop, Portland, Ore., has purchased adjoining property and will erect a new machine shop.

The Bach Aircraft Co., Inc., Clover Field, Santa Monica, Cal., has been organized to manufacture airplanes. It will specialize in eight-passenger cabin type monoplanes, made of wood with steel reinforcements.

The Sheet Metal Products Co., Los Angeles, has been organized as a subsidiary of the Highland Park Sheet Metal Works to manufacture sheet metal products, particularly hospital equipment. No new equipment will be needed, but the company is constantly in the market for materials.

The Baltic Ice Machine Co., 1107 South Fremont Street, Alhambra, Cal., has been formed to manufacture refrigerating units and is in the market for materials. The company's plant is in operation and no new equipment will be needed.

Foreign

THE Norwegian Hydro-Electric Nitrogen Corporation (Norsk Hydro-Elektrisk Kvaelstofaktieselskab), Christiania, Norway, operating a nitrate and fertilizer plant, with hydroelectric generating station of 375,000 hp. capacity, in southern Norway, is disposing of a bond issue of $30,000,000 in the United States, through the National City Co., National City Bank Building, New York, a considerable portion of the fund to be used for plant expansion. The company has been operating under the electric arc process and has arranged with German interests for the adoption of the Haber-Bosch ammonia process. Equipment will be installed to develop a capacity of 535,000 tons of nitrate of lime per annum, or more than twice the present output. Dr. Axel Aubert is managing director.

A public utility company is being formed at Batavia, Java, to construct and operate a waterworks for the municipality of Solo. The company will be capitalized at 500,000 florins (about $200,000), and will be financed to a considerable extent by the Netherland East Indian Government. It is purposed to dispose of a bond issue of about 1,700,000 florins (about $680,000), to be used for the project, which will consist of pumping machinery, power equipment, pipe lines, etc. The American Consulate, Batavia, Thomas C. Barringer, trade commissioner, has information regarding the enterprise.

The Compania General de Tabacos de Filipinas, Barcelona, Spain, is completing arrangements for the construction of a new cane sugar mill in the Philippine Islands, to cost in excess of $1,000,000 with machinery. Contract has been let to the United States Steel Corporation, 71 Broadway, New York, for structural steel for building units and other awards will be scheduled in the near future. It is understood that orders for certain electrical apparatus have been placed with the General Electric Co., Schenectady, N. Y.

The Fox Brothers International Corporation, 33 Rector Street, New York, exporter and importer, has contracted with the Government of Turkey, Angora, for the construction and equipment of new locomotive and car shops at Kaisaria, one of the principal terminal points on a railroad line now being built to connect Angora with Kaisaria, Sivas and vicinity. Bids will be asked at once for machinery and other equipment, which it is expected to purchase in the United States.

Contract for a branch plant at Yokohama, Japan, for the Ford Motor Co., has been let to the H. K. Ferguson Co., Cleveland. The main building will be 300 x 480 ft. with saw-tooth design and insulated roof deck and will have a capacity of 200 cars daily. It will be an assembling plant for both Ford and Lincoln cars and is expected to be completed by August, 1928.

British exports of textile machinery during the first nine months of 1927 were 86,434 tons valued at £8,500,167, 11,133 tons greater than in the corresponding period of 1926, but 3412 tons lower than in 1925, say advices from the American Consulate General at London, made public by the Department of Commerce. The exports during the current third quarter totaled 29,201 tons, which was somewhat higher than the average for the two preceding quarters.

Exports of German internal combustion engines have risen from 23,304 metric tons valued at 36,647,000 m. during 1925 to 24,411 metric tons valued at 41,999,000 m. in 1926, reports Trade Commissioner James T. Scott, Hamburg, to the Department of Commerce. During the first half of 1927 this trade amounted to 11,990 metric tons valued at 21,723,000 m.

The George J. Hagan Co. has received contract from the F. I. A. T. Co., Torino, Italy, for five electric furnaces for the heat treatment of automobile parts.

Canada

TORONTO, Nov. 21.

SO far this month the machine tool business has been maintained at a good level in this territory. Railroad buying for shop equipment has been a strong factor in the market and additional orders are expected before the end of the year. Some large lists from the automotive industry also are still in prospect.

The Wallaceburg Ship Building Co., Wallaceburg, Ont., expects to build an addition to its plant and to install new equipment. It is the intention to enlarge its works so as to be in position to take care of the largest ships on the Great Lakes.

The Ferro Enamel Co. of Canada, Ltd., contemplates establishing a manufacturing plant at Kingston, Ont., within the next two months. It was recently granted a Dominion charter and has been supplying this market from its plant at Cleveland.

The Hilltop Gold Mines, Ltd., Boston Creek, Ont., is arranging for the installation of an electric plant at its local property. New buildings will be erected.

At a meeting of the shareholders of the Matthew Moody & Sons Co. held in Montreal, the sale of the plant and assets at Terrebonne, Que., to Hale, Perusse & Co., Ltd., was ratified. A new company is being formed to operate the plant, and it is understood that the production of agricultural implements will be carried out on a larger scale.

The Beach Foundry, Ltd., Ottawa, Ont., manufacturer of gas and electric ranges, stoves, heaters and furnaces, etc., has under construction an extension to its plant which will provide 115,000 ft. additional floor space. The company recently installed a new 3-ton electric furnace. Considerable new equipment will be installed.

The Ludlum Steel Co., Watervliet, N. Y., in the nine months ended Sept. 30, had net income of $200,678, equivalent after interest depreciation and Federal taxes, to $1.48 a share on the common stock. This compares with $242,748 or $1.79 a share in the corresponding period last year. Net income in the September quarter was $66,255, compared with $78,850 in the June quarter and with $62,928 in the September quarter last year.

NEW TRADE PUBLICATIONS

Breathing Roof for Storage Tanks.—Chicago Bridge & Iron Works, 37 West Van Buren Street, Chicago. Pamphlet of 12 pages and cover illustrating a flexible roof for oil tanks, giving opporunity for expansion of the vapor above the oil as temperature rises during the day. This is said to be leak-proof and to avoid a considerable quantity of loss.

Use and Care of Wire Rope.—Leschen & Sons Rope Co., 5909 Kennerly Avenue, St. Louis. Pocket-size booklet of 32 pages illustrating and describing methods of handling wire rope to prevent kinks and other trouble in the use of the rope. Much information is given as to splicing, seizing and applying fixtures.

Dry Quenching of Coke.—International Combustion Engineering Corporation, Madison Avenue and Thirty-fifth Street, New York. Four-page folder describing the Sulzer system for dry quenching of coke. This was described in some detail in THE IRON AGE of Feb. 10, 1927, page 425. A number of European installations are cited, but the only American equipment is at Rochester.

Board Drop Hammers.—Erie Foundry Co., Erie, Pa. Bulletin No. 150, devoted to 4-roll board drop hammers. The construction allows for building the hammers in sizes larger than have even been built before, but applied to smaller sizes is regarded as increasing productivity and life of the machines.

Industrial Trailers.—Mercury Mfg. Co., 4118 South Halsted Street, Chicago. Three bulletins, A-100, A-125 and M-130, illustrate and describe trailers of various types for connection into industrial trains, and self-couplers for making connections between trailers and between a trailer and a tractor. The angle at which these may turn is such that the minimum radius as shown by diagram is 8½ ft. The trailers are made in capacities up to 4000 lb. or more and of several types, including the self-dumping.

Pulverizers.—Bethlehem Steel Co., Bethlehem, Pa. Catalog J of 22 pages illustrates and describes pulverizers designed for low power and maintenance costs. The equipment is made in various styles and sizes to suit conditions and requirements and pulverizes a wide variety of materials, including coal, various ores, sand, marble, clay, magnesite, etc.

Expansion Joints.—Gradon Mfg. Co., Philadelphia. Bulletin 709 of four pages featuring guided expansion joints, with the guide and the stuffing box in one rigid piece, thus avoiding lack of proper alinement.

Orifice Meter.—Metric Metal Works, Erie, Pa. Bulletin 302 of eight pages deals with the Linderman orifice meter designed for measuring gas in large volumes. Illustrations include both line drawings and installation photographs.

Boiler Room Instruments.—Brown Instrument Co., Philadelphia. An unusual presentation of the need for boiler room recording instruments and the uses made of them. It is well illustrated.

Regulators for Gas Producers.—Chowning Regulator Corporation, Corning, N. Y. Four catalogs devoted to gas producer regulation and controls therewith. They are well illustrated, both with line-cuts of records and with half-tones, many of them sectional, showing the way the equipment operates.

Mechanical Drive Turbines.—Westinghouse Electric & Mfg. Co., East Pittsburgh. Leaflet 3907-C describes turbines for mechanical drives in capacities from 5 to 750 brake hp. These turbines are suited for driving circulating pumps, centrifugal boiler feed pumps, blowers and other rotary apparatus, either directly or through the medium of reduction gears. There are a number of illustrations.

Milling Machines.—The Ingersoll Milling Machine Co., Rockford, Ill. Bulletin No. 47, profusely illustrated to show the more common types of Ingersoll milling machines and some of the operations for which they are adopted.

Mond Nickel Pellets.—American Mond Nickel Co., Century Building, Pittsburgh. Gives a brief account of the Mond process of refining nickel, and some applications of the high purity metal obtained thereby. Nickel pellets are marketed in various sizes: as fines for alloying with cast iron; ⅛-in. size for production of white gold; and ½ to ¼-in. size (either loose or in weighed canisters) for making alloy steels and bronzes.

Winches, Cranes and Derricks.—Silent Hoist Winch & Crane Co., 762 Henry Street, Brooklyn, N. Y. Bulletin No. 30 of four pages, illustrating and describing several varieties of winches, cranes and derricks for gasoline and electric motor trucks and tractors.

Fin Furnaces.—Combustion Engineering Corporation, 200 Madison Avenue, New York. Catalog FF-2 of 24 pages, devoted to the construction and installaton of water-cooled furnaces for boilers. The first furnace of this type was out in operation in 1923, since which time it has been installed under boilers of more than 500,000 hp. Most of the illustrations are diagrams showing different types of boilers and methods of installation.

Industrial Finances

The Westinghouse Electric & Mfg. Co., East Pittsburgh, in the quarter ended Sept. 30, had net profit of $3,718,325, after all charges equivalent to $1.57 a share on common stock. This compares with $2,756,014 or $1.16 a share in the proceding quarter.

The American Steel Foundries, Chicago, had net profits in the September quarter of $942,311, comparing with $1,275,792 in the preceding quarter and with $1,040,571 in the September quarter last year. Nine months' net amounted to $3,505,551, as against $3,965,962 in the corresponding period of 1926.

The Colorado Fuel & Iron Co., Denver, in the quarter ended Sept. 30, had net income of $80,137, after interest, depreciation, etc., but before Federal taxes, and equivalent after preferred dividends to 12c. a share on the common stock. This compares with $836,193 or $2.34 a share in the preceding quarter and with a net loss of $638,254 in the September quarter last year. Consolidated net income in the first nine months of the present year amounted to $2,535,679 or $7.10 a share on common, as against $977,753 or $2.52 a share in the corresponding period of 1926.

The New Jersey Zinc Co. reports net income of $1,610,106, after taxes, depreciation, depletion, etc., equivalent to $3.28 a share on common stock for the quarter ended Sept. 30. This compares with $1,975,514 or $4.02 in the preceding quarter and with $1,673,823 or $3.41 a share in the September quarter of 1926.

The J. I. Case Plow Works, Inc., Rock Island, Ill., in the year ended Aug. 31, 1927, had net profit of $153,822 after depreciation, interest and taxes, equivalent after allowing for dividend requirements on Class A stock, to 33c. a share on the no par Class B stock. This compares with $128,017 or 17c. a share in the previous fiscal year.

Net income of the A. M. Byers Co., Pittsburgh, in the September quarter was $303,962, comparing with $419,000 in the corresponding quarter of 1926. Net profit in the year ended Sept. 30, as compiled from quarterly reports, amounted to $1,373,012, after all charges, as against $1,490,332 in the previous fiscal year.

The Underwood Typewriter Co. had net profit in the September quarter of $426,845, after depreciation and Federal taxes, as against $380,762 in the previous quarter and $345,191 in the corresponding quarter of 1926.

Rimamurany-Salgo-Tarjan Iron-Works Co., Ltd., Budapest, Hungary, (Rima Steel Corporation) in the year ended June 30, 1927, had net profits of $522,478 as compared with $308,844 in the preceding fiscal year. Pig iron made in the year ended June 30, 1927, amounted to approximately 190,000 tons, as against 147,000 tons in the previous year, and 250,000 tons of raw steel was made last year, as compared with 185,000 tons in the period ended June 30, 1926.

Branch Office Representatives of The Iron Age

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